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PART II

ENVIRONMENTAL PROTECTION AGENCY

■

Requirements for Preparation, Adoption, and Submittal of Implementation Plans

Title 42—PUBLIC HEALTH

Chapter IV—Environmental Protection Agency

PART 420—REQUIREMENTS FOR PREPARATION, ADOPTION, AND SUBMITTAL OF IMPLEMENTATION PLANS

On April 30, 1971 (36 F.R. 8186), pursuant to section 109 of the Clean Air Act, as amended, the Administrator promulgated national ambient air quality standards for sulfur oxides, particulate matter, carbon monoxide, photochemical oxidants, hydrocarbons, and nitrogen dioxide. Within 9 months thereafter, i.e., no later than January 30, 1972, each State is required by section 110 of the Act to adopt and submit to the Administrator a plan which provides for the implementation, maintenance, and enforcement of such national ambient air quality standards within each air quality control region (or portion thereof) within the State. An additional period of no longer than 18 months may be allowed for adoption and submittal of that portion of a plan relating to implementation of secondary ambient air quality standards. State plans must provide for attainment of national primary ambient air quality standards within 3 years after the date of the Administrator's approval of such plans, except that a 2-year extension of this deadline may be granted by the Administrator upon application by a Governor if the application satisfies the requirements set forth in section 110(e) of the Act. State plans must provide for attainment of national secondary ambient air quality standards within a reasonable time. Within 4 months from the date on which State plans are required to be submitted, the Administrator must approve or disapprove such plans or portions thereof.

A notice of proposed rule making published in the FEDERAL REGISTER on April 7, 1971 (36 F.R. 6680), set forth regulations applicable to preparation, adoption, and submittal by the States of such implementation plans. Interested parties have been afforded an opportunity to participate in the rule making by submitting comments. A total of more than 400 interested parties, including Federal, State, and local agencies, citizens groups, and commercial and industrial organizations submitted comments. Following review of the proposed regulations, and consideration of the comments, the regulations, including the appendices, have been revised and are being promulgated today. The principal revisions are described below:

1. Provisions have been added to encourage States to consider the socio-economic impact and the relative costs and benefits of the various emission control strategies which can be employed to attain and maintain the national standards. Emission charges or taxes or other economic incentive schemes have been included among the measures which States may employ as part of a control strategy.

2. The requirement that States establish and operate a permit system has been eliminated; States still will be required to have authority to prevent construction, modification, or operation of sources.

3. The system for classification of regions has been modified to provide for a subclassification of Priority I regions in certain cases. The provisions for use of an example region in the formulation and application of control strategies have been modified.

4. Where a State plan provides for inspection and testing of motor vehicles and/or other transportation control measures or land use control measures, the plan will have to indicate when the State will have legal authority to impose such measures. All other legal authority will have to be available at the time the plan is submitted. Legal authority adequate to fulfill some of the requirements of § 420.11 may be delegated to a State under section 114 of the Act. Section 420.11 has also been revised to emphasize that State agencies other than State air pollution control agencies, as well as local agencies, may participate in carrying out an implementation plan.

5. The provisions dealing with public hearings have been revised to require at least 30 days' notice of public hearings on proposed State implementation plans and to define "reasonable notice" to include prominent advertisement of the dates, times, and places of such hearings and of the availability of the proposed plans for public inspection.

6. The fixed deadline for requests for preliminary review of State plans has been eliminated. Nevertheless, State agencies desiring such preliminary review by the Environmental Protection Agency should make their requests well ahead of the statutory deadline for submittal of plans, i.e., January 30, 1972, preferably, at least 90 days in advance. Preliminary review results will be made available, on requests, to all interested parties.

7. Section 420.10 has been revised to require that State plans provide for public availability of emission data reported by source owners or operators or otherwise obtained by a State or local agency; such emission data must be correlated with applicable emission limitations.

8. The definition of "reasonable time" for attainment of national secondary ambient air quality standards for sulfur oxides and particulate matter has been modified. As revised, it provides for consideration of the degree of emission reduction needed for attainment of such secondary standards and the social, economic, and technological factors in those cases where it is shown that more than 3 years will be necessary.

9. Requirements for legally enforceable compliance schedules have been more clearly spelled out.

10. The provisions dealing with emergency episode planning have been modified. In the near future, the Administrator will identify the ambient pollutant concentrations which, in his judgment, would cause substantial endangerment.

11. Air quality surveillance systems will be required to be in operation not later than 2 years after the Administrator's approval of a State plan. There also have been revisions with respect to measurement methods in order to insure that the results obtained with methods other than those prescribed (36 F.R. 8186) as reference methods have a consistent relationship to the results obtained with the reference methods.

12. Appendix B has been recast as a series of statements reflecting emission limitations attainable through the application of reasonably available control technology. This change was made as a way of avoiding misinterpretation of appendix B. A revised introduction to the appendix explains its purpose more clearly.

13. A great many other revisions have also been made. States and other interested parties are therefore urged to make a careful reading of these regulations.

In the comments submitted to the Environmental Protection Agency following publication of the notice of proposed rule-making, many questions were raised about land use and transportation control measures. The Environmental Protection Agency is engaged in the preparation of information to assist States in employing such measures in their programs for attainment and maintenance of the national ambient air quality standards. There will be included, among other things, information on the extent to which motor vehicle inspection programs and emission control devices applicable to in-use motor vehicles can be expected to contribute to improvements in ambient air quality.

The Regulations for Preparation, Adoption, and Submittal of Implementation Plans, Part 420, are hereby promulgated effective upon publication (8–14–71).

Dated: August 3, 1971.

ROBERT W. FRI,
Acting Administrator.

A new Part 420 is added to Chapter IV, Title 42, Code of Federal Regulations, as follows:

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AUTHORITY: The provisions of this Part 420 issued under section 301(a) of the Clean Air Act (42 U.S.C. 1857(a), as amended by section 15(c)(2) of Public Law 91-604, 84 Stat. 1713.

Subpart A—General Provisions

§ 420.1 Definitions.

As used in this part, all terms not defined herein shall have the meaning given them in the Act:

(a) "Act" means the Clean Air Act (42 U.S.C. 1857–18571, as amended by Public Law 91–604, 84 Stat. 1676).

(b) "Administrator" means the Administrator of the Environmental Protection Agency (EPA) or his authorized representative.

(c) "Primary standard' means a national primary ambient air quality standard promulgated pursuant to section 109 of the Act.

(d) "Secondary standard' means a national secondary ambient air quality standard promulgated pursuant to section 109 of the Act.

(e) "National standard" means either a primary or a secondary standard.

(f) "Plan" means an implementation plan, under section 110 of the Act, to attain and maintain a national standard.

(g) "Applicable plan" means a plan or portion thereof, or the most recent revision of such plan or portion thereof, which has been approved or promulgated by the Administrator pursuant to section 110 of the Act.

(h) "Regional Office" means one of the ten (10) EPA Regional Offices.

(i) "State agency" means the air pollution control agency primarily responsible for development and implementation of a plan under the Act.

(j) "Local agency" means any air pollution control agency other than a State agency, which is charged with responsibility for carrying out a portion of a plan.

(k) "Point source" means:

(1) Any stationary source causing emissions in excess of 100 tons (90.7 metric tons) per year of any pollutant for which there is a national standard in a region containing an area whose 1970 "urban place" population, as defined by the Bureau of Census, was equal to or greater than 1 million or

(2) Any stationary source causing emissions in excess of 25 tons (22.7 metric tons) per year of any pollutant for which there is a national standard in a region containing an area whose 1970 "urban place" population, as defined by the U.S. Bureau of the Census, was less than 1 million and

(3) Without regard to amount of emissions, stationary sources such as those listed in Appendix C to this part.

(l) "Area source" means any small residential, governmental, institutional, commercial, or industrial fuel combustion operations: onsite waste disposal facility; motor vehicles, aircraft, vessels, or other transportation facilities; or other miscellaneous sources such as those listed in Appendix D to this part, as identified through inventory techniques similar to those described in: "A Rapid Survey Technique for Estimating Community Air Pollution Emissions," Public Health Service Publication No. 999–AP–29, October 1966.

(m) "Region" means (1) an air quality control region designated by the Secretary of Health, Education, and Welfare or the Administrator, (2) any area designated by a State agency as an air quality control region and approved by the Administrator, or (3) any area of a State not designated as an air quality control region under subparagraph (1) or (2) of this paragraph.

(n) "Control strategy" means a combination of measures designated to achieve the aggregate reduction of emissions necessary for attainment and maintenance of a national standard, including, but not limited to, measures such as:

(1) Emission limitations.

(2) Federal or State emission charges or taxes or other economic incentives or disincentives.

(3) Closing or relocation of residential, commercial, or industrial facilities.

(4) Changes in schedules or methods of operation of commercial or industrial facilities or transportation systems, including, but not limited to, short-term changes made in accordance with standby plans.

(5) Periodic inspection and testing of motor vehicle emission control systems, at such time as the Administrator determines that such programs are feasible and practicable.

(6) Emission control measures applicable to in-use motor vehicles, including, but not limited to, measures such as mandatory maintenance, installation of emission control devices, and conversion to gaseous fuels.

(7) Measures to reduce motor vehicle traffic, including, but not limited to, measures such as commuter taxes, gasoline rationing; parking restrictions, or staggered working hours.

(8) Expansion or promotion of the use of mass transportation facilities through measures such as increases in the frequency, convenience, and passenger-carrying capacity of mass transportation systems or providing for special bus lanes on major streets and highways.

(9) Any land use or transportation control measures not specifically delineated herein.

(10) Any variation of, or alternative to, any measure delineated herein.

(o) "Reasonably available control technology" means devices, systems, process modifications, or other apparatus or techniques, the application of which will permit attainment of the emission limitations set forth in Appendix B to this part, provided that Appendix B to this part is not intended, and shall not be construed, to require or encourage State agencies to adopt such emission limitations without due consideration of (1) the necessity of imposing such emission limitations in order to attain and maintain a national standard, (2) the social and economic impact of such emission limitations, and (3) alternative means of providing for attainment and maintenance of such national standard.

§ 420.2 Stipulations.

Nothing in this part shall be construed in any manner:

(a) To encourage a State to prepare, adopt, or submit a plan which does not provide for the protection and enhancement of air quality so as to promote the public health and welfare and productive capacity.

(b) To encourage a State to adopt any particular control strategy without taking into consideration the cost-effectiveness of such control strategy in relation to that of alternative control strategies.

(c) To preclude a State from employing techniques other than those specified in this part for purposes of estimating air quality or demonstrating the adequacy of a control strategy, provided that such other techniques are shown to be adequate and appropriate for such purposes.

(d) To encourage a State to prepare, adopt, or submit a plan without taking into consideration the social and economic impact of the control strategy set forth in such plan, including, but not limited to, impact on availability of fuels, energy, transportation, and employment.

(e) To preclude a State from preparing, adopting, or submitting a plan which provides for attainment and maintenance of a national standard through the application of a control strategy not specifically identified or described in this part.

(f) To preclude a State or political subdivision thereof from adopting or enforcing any emission limitations or other measures or combinations thereof to attain and maintain air quality better than that required by a national standard.

(g) To encourage a State to adopt a control strategy uniformly applicable throughout a region unless there is no satisfactory alternative way of providing for attainment and maintenance of a national standard throughout such region.

§ 420.3 Classification of regions.

This section establishes a classification system to categorize regions for purposes of plan development and evaluation. The requirements of this part vary according to the classification of each region, in order that the time and resources to be expended in developing the plan for that region, as well as the substantive content of the plan, will be commensurate with the complexity of the air pollution problem. The classification will be based upon measured ambient air quality, where known, or, where not known, estimated air quality in the area of maximum pollutant concentration. All regions will be classified by the Administrator after consultation with State agencies. Each region will be classified separately with respect to each of the following pollutants: Sulfur oxides, particulate matter, carbon monoxide, nitrogen dioxide, and photochemical oxidants.

(a) For sulfur oxides and particulate matter, each region will be classified into one of three categories, defined as Priority I, Priority II, or Priority III.

(1) (i) Ambient concentration limits, expressed as micrograms per cubic meter and parts per million by volume (p.p.m. in parentheses) which define the classification system for sulfur oxides and particulate matter are:

Pollutant	Priority		
	I	II	III
Sulfur oxides:	*Greater than*	*From—To*	*Less than*
Annual arithmetic mean	100 (0.04)	60–100 (0.02–0.04)	60 (0.02)
24-hour maximum	455 (0.17)	260–455 (0.10–0.17)	260 (0.10)
3-hour maximum		[1] –1,300 (0.50)	1,300 (0.50)
Particulate matter:			
Annual geometric mean	95	60–95	60
24-hour maximum	325	150–325	150

[1] Any concentration above 1,300 $\mu g/m^3$ (0.50 p.p.m.).

(ii) The more restrictive classification will be chosen where there is a difference between the maximum value(s) and the annual averages e.g., if a region is Priority I with respect to an annual average and Priority II with respect to a 24-hour maximum value, the classification will be Priority I.

(2) Procedures which may be used, where appropriate, to estimate air quality in regions where no measured data or inadequate data exist are described in Appendix A to this part.

(b) For carbon monoxide, nitrogen dioxide, and photochemical oxidants, each region will be classified into one of two categories defined as Priority I or Priority III.

(1) Ambient concentration limits which define the classification system are:

(i) Carbon monoxide: Priority I: Equal to or above 55 milligrams per cubic meter (48 p.p.m.), 1-hour maximum, or 14 milligrams per cubic meter (12 p.p.m.), 8-hour maximum; Priority III: Below such values.

(ii) Nitrogen dioxide: Priority I: Equal to or above 110 micrograms per cubic meter (0.06 p.p.m.); Priority III: Below such value.

(iii) Photochemical oxidants: Priority I: Equal to or above 195 micrograms per cubic meter (0.10 p.p.m.), 1-hour maximum; Priority III: Below such value.

(2) In the absence of measured data to the contrary, classification with respect to carbon monoxide, photochemical oxidants and nitrogen dioxide will be based on the following estimate of the relationship between these pollutants and population: Any region containing an area whose 1970 "urban place" population, as defined in the U.S. Bureau of Census, exceeds 200,000 will be classified Priority I. All other regions will be classified Priority III.

(3) Where a region is classified Priority I on the basis of population, the air quality data requirements of § 420.14 (e) (1) shall apply. If these data indicate the pollutant concentrations are below the values stipulated in subparagraph (1) of this paragraph, the region will be reclassified Priority III.

(4) Classifications with respect to hydrocarbons will be the same as the classifications with respect to photochemical oxidants.

(c) Where a region is classified Priority I on the basis of measured or estimated air quality levels reflecting emissions predominantly from a single point source, it shall be further classified Priority IA. The requirements applicable to Priority IA regions shall be the same as those for other Priority I regions, except that the requirements applicable to Priority II regions under §§ 420.16 and 420.17 shall apply. A procedure for estimating air quality levels reflecting emissions from a single point source is described in Appendix A to this part.

§ 420.4 Public hearings.

(a) The State shall, prior to adoption of a plan and after reasonable notice thereof, conduct one or more public hearings on each plan. Separate hearings may be held for plans to implement primary and secondary standards.

(b) For purposes of this part, "reasonable notice" shall be considered to include, at least 30 days prior to the date of such hearing(s):

(1) Notice given to the public by prominent advertisement announcing the date(s), time(s), and place(s) of such hearing(s) and the availability of the principal portions of the proposed plan, including, as a minimum, all rules and regulations which are proposed to be included in such plan, for public inspection in at least one location in each region to which the plan will apply.

(2) Notification to the Administrator (through the appropirate Regional Office).

(3) Notification to any local air pollution control agencies in each region to which the plan will apply.

(4) In the case of an interstate region, notification to any other States included, in whole or in part, in the region.

(c) The State shall prepare and retain, for submission to the Administrator upon his request, a record of the hearing(s). The record shall contain, as a minimum, a list of witnesses together with the text of each presentation.

(d) The State shall submit with its plan (1) a copy of any advertisement published, broadcast, or otherwise issued pursuant to this section; and (2) a certification that the hearing was held in accordance with the notice required by this section.

§ 420.5 Submission of plans; preliminary review of plans.

(a) Submission to the Administrator shall be accomplished by delivering five copies of the plan to the appropriate Regional Office and a letter to the Administrator notifying him of such action. Plans shall be adopted by the State and submitted to the Administrator by the Governor as follows:

(1) For any primary standard, within 9 months after promulgation of such standard.

(2) For any secondary standard, within 9 months after promulgation of such secondary standard or by such later date prescribed by the Administrator pursuant to Subpart C of this part.

(b) Plans for different regions within a State may be submitted as a single document or as separate documents.

(c) Upon request of a State, the Administrator will provide preliminary review of a plan or portion thereof submitted in advance of the date such plan is due. Such requests shall be made in writing to the appropriate Regional Office and shall be accompanied by five copies of the materials to be reviewed. Requests for preliminary review shall not operate to relieve a State of the responsibility of adopting and submitting plans in accordance with prescribed due dates.

§ 420.6 Revisions.

(a) The plan shall be revised from time to time, as may be necessary, to take account of:

(1) Revisions of national standards,

(2) The availability of improved or more expeditious methods of attaining such standards, such as improved technology or emission charges or taxes, or

(3) A finding by the Administrator that the plan is substantially inadequate to attain or maintain the national standard which it implements.

(b) The plan shall be revised within 60 days following notification by the Administrator under paragraph (a) of this section, or by such later date prescribed by the Administrator after consultation with the State.

(c) Revisions of rules and regulations included in an applicable plan shall be adopted after reasonable notice and public hearings, as prescribed in § 420.4.

(d) Any revision of rules and regulations and of compliance schedules shall be submitted to the Administrator in ac-

cordance with § 420.5 within 60 days following its adoption.

(e) Revisions other than those covered by paragraph (b) of this section shall be identified and described in the semiannual report required by § 420.7.

§ 420.7 Reports.

(a) On a quarterly basis commencing with the end of the first full quarter after approval of a plan, or any portion thereof, by the Administrator, the State shall submit to the Administrator (through the appropriate Regional Office) information on air quality. The quarters of the year are January 1–March 31, April 1–June 30, July 1–September 30, and October 1–December 31.

(b) On a semiannual basis commencing with the end of the first full semiannual period after approval of a plan, or any portion thereof, by the Administrator, the State shall submit to the Administrator (through the appropriate Regional Office) reports on progress in carrying out the applicable plan. The semiannual periods are January 1–June 30 and July 1–December 31.

(c) The reports required by this section shall be submitted within 45 days after the end of each reporting period in a manner which shall be prescribed by the Administrator.

§ 420.8 Approval of plans.

The Administrator shall approve any plan, or portion thereof, or any revision of such plan, or portion thereof, if he determines that it meets the requirements of the Act. Revisions of a plan, or any portion thereof, shall not be considered part of an applicable plan until such revisions have been approved by the Administrator in accordance with this part.

Subpart B—Plan Content and Requirements

§ 420.10 General requirements.

(a) During development of a plan, the State is encouraged to identify alternative control strategies, as well as the costs and benefits of each such alternative, for attainment and maintenance of the national standards.

(b) Each plan implementing a primary standard shall provide for the attainment of such standard as expeditiously as practicable, but in no case, except as otherwise provided by Subpart C of this part, later than 3 years after the date of the Administrator's approval of such plan or any revision thereof to take account of a revised primary standard. The projected date of attainment of such standard shall be specified in the plan.

(c) Each plan implementing a secondary standard shall provide for the attainment of such standard by a specified date, which shall be within a reasonable time after the date of the Administrator's approval of such plan.

(d) The plan for each region shall have adequate provisions to insure that pollutant emissions within such region will not interfere with attainment and maintenance of any national standard in any portion of an interstate region or in any other region.

(e) Each plan shall provide for public availability of emission data reported by source owners or operators or otherwise obtained by a State or local agency. Such emission data shall be correlated with applicable emission limitations or other measures. As used in this paragraph, "correlated" means presented in such a manner as to show the relationship between measured or estimated amounts of emissions and the amounts of such emissions allowable under the applicable emission limitations or other measures.

§ 420.11 Legal authority.

(a) Each plan shall show that the State has legal authority to carry out the plan, including authority to:

(1) Adopt emission standards and limitations and any other measures necessary for attainment and maintenance of national standards.

(2) Enforce applicable laws, regulations, and standards, and seek injunctive relief.

(3) Abate pollutant emissions on an emergency basis to prevent substantial endangerment to the health of persons, i.e., authority comparable to that available to the Administrator under section 303 of the Act.

(4) Prevent construction, modification, or operation of any stationary source at any location where emissions from such source will prevent the attainment or maintenance of a national standard.

(5) Obtain information necessary to determine whether air pollution sources are in compliance with applicable laws, regulations, and standards, including authority to require recordkeeping and to make inspections and conduct tests of air pollution sources.

(6) Require owners or operators of stationary sources to install, maintain, and use emission monitoring devices and to make periodic reports to the State on the nature and amounts of emissions from such stationary sources; also authority for the State to make such data available to the public as reported and as correlated with any applicable emission standards or limitations.

(b) Where a plan sets forth a control strategy that provides for application of (1) inspection and testing of motor vehicles and/or other transportation control measures or (2) land use measures other than those referred to in § 420.11(a)(4), such plan shall set forth the State's timetable for obtaining such legal authority as may be necessary to carry out such measures.

(c) The provisions of law or regulation which the State determines provide the authorities required under this section shall be specifically identified, and copies of such laws or regulations shall be submitted with the plan.

(d) (1) Except as otherwise provided by paragraph (b) of this section, the plan shall show that the legal authorities specified in this section are available to the State at the time of submission of the plan.

(2) Legal authority adequate to fulfill the requirements of paragraph (a) (5) and (6) of this section may be delegated the State pursuant to section 114 of the Act.

(e) A State governmental agency other than the State air pollution control agency may be assigned responsibility for carrying out a portion of a plan: *Provided,* That such plan demonstrates, to the Administrator's satisfaction, that such State governmental agency has the legal authority necessary to carry out such portion of the plan or, pursuant to paragraph (b) of this section, has a timetable for obtaining such authority.

(f) The State may authorize a local agency to carry out a plan, or portion thereof, within such local agency's jurisdiction: *Provided,* That such plan demonstrates, to the Administrator's satisfaction, that such local agency has the legal authority necessary to implement such plan, or portion thereof, and further: *Provided,* That such authorization shall not relieve the State of responsibility under the Act for carrying out such plan, or portion thereof.

§ 420.12 Control strategy: General.

(a) In any region where existing (measured or estimated) ambient levels of a pollutant exceed the levels specified by an applicable national standard, the plan shall set forth a control strategy which shall provide for the degree of emission reduction necessary for attainment and maintenance of such national standard, including the degree of emission reduction necessary to offset emission increases that can reasonably be expected to result from projected growth of population, industrial activity, motor vehicle traffic, or other factors that may cause or contribute to increase emissions.

(b) In any region where measured or estimated ambient levels of a pollutant are below the levels specified by an applicable secondary standard, the plan shall set forth a control strategy which shall be adequate to prevent such ambient pollution levels from exceeding such secondary standard.

(c) Portions of a control strategy applicable to area sources may differ from portions applicable to point sources.

(d) For purposes of developing a control strategy, data derived from measurements of existing ambient levels of a pollutant may be adjusted to reflect the extent to which occasional natural or accidental phenomena, e.g., dust storms, forest fires, industrial accidents, demonstrably affected such ambient levels during the measurement period.

§ 420.13 Control strategy: Sulfur oxides and particulate matter.

(a) In any region where emission reductions are necessary for attainment and maintenance of a primary standard for sulfur oxides or particulate matter, the plan shall set forth a control strategy which shall be adjusted for the attainment of such primary standard within the time prescribed by the Act.

(b) (1) In any region where the degree of emission reduction necessary for attainment and maintenance of a secondary standard for sulfur oxides can

be achieved through the application of reasonably available control technology, "reasonable time" for attainment of such secondary standard, pursuant to § 420.10 (c), shall be not more than 3 years unless the State shows that good cause exists for postponing application of such control technology.

(2) In any region where application of reasonably available control technology will not be sufficient for attainment and maintenance of such secondary standard, or where the State shows that good cause exists for postponing the application of such control technology, "reasonable time" shall depend on the degree of emission reduction needed for attainment of such secondary standard and on the social, economic, and technological problems involved in carrying out a control strategy adequate for attainment and maintenance of such secondary standard.

(c) For purposes of developing a control strategy, background concentration shall be taken into consideration with respect to particulate matter. As used in this subpart, "background concentration" is that portion of the measured ambient levels of particulate matter that cannot be reduced by controlling emissions from manmade sources; "background concentration" shall be determined by reference to measured ambient levels of particulate matter in nonurban areas.

(d) Example regions:

(1) A control strategy which provides for the attainment and maintenance of a national standard for sulfur oxides or particulate matter in any region in a State (excluding Priority IA regions) will be deemed by the Administrator to be adequate for attainment and maintenance of such standard in any or all other regions of the regions of the same Priority classification in which measured or estimated levels of the pollutant are lower than those in the region for which the control strategy was formulated: *Provided,* That such control strategy is sufficiently comprehensive to include adequate control of sulfur oxides or particulate emissions from sources listed in Appendix C to this part. Any region (i) for which the State formulates a control strategy which is applied to other regions or (ii) for which a control strategy is developed, without regard to whether such strategy is applied outside of the region, is referred to hereinafter as an "example region."

(2) The State shall obtain, through the appropriate Regional Office, the concurrence of the Administrator in the selection of an example region.

(3) Nothing in this section shall be construed in any manner to preclude a State from preparing, adopting, and submitting a separate plan for each region.

(e) Adequacy of control strategy:

(1) The plan shall demonstrate that the control strategy for each national standard for sulfur oxides or particulate matter is adequate for attainment and maintenance of such standard in the example region(s) to which it applies. The adequacy of a control strategy shall be demonstrated by means of a proportional model or diffusion model or other procedure which is shown to be adequate and appropriate for such purpose.

(2) (i) If such demonstration is made by use of a proportional model, such model shall be one in which the following equation is employed to calculate the degree of improvement in air quality needed for attainment of a national standard:

$$\frac{A-C}{A-B}\times 100 = \text{percent reduction needed}$$

Where:

A = Existing air quality at the location having the highest measured or estimated concentration in the region.
B = Background concentration.
C = National standard.

(ii) The above equation does not account for topography, spatial distribution of emissions, or stack height, but the significance of these parameters shall be considered in developing the control strategy.

(iii) The plan shall show that application of the control strategy will result in the degree of emission reduction indicated to be necessary by the above calculation, as modified by appropriate consideration of factors set forth in subdivision (ii) of this subparagraph. The plan shall contain a summary of the computations used to determine the emission reductions that will result from application of the control strategy to each point source and group of area sources; such summary shall be included in a table similar to that presented in Appendix D to this part. The detailed computations shall be retained and be made available for inspection by the Administrator.

(3) (i) If such demonstration is made by use of a diffusion model, such model shall be identified and described: *Provided, however,* That if either of the two diffusion models described in the following publications is used, it need only be identified:

Air Quality Implementation Planning Program (IPP), Volume I, Operator's Manual, National Air Pollution Control Administration, Environmental Protection Agency, Washington, D.C., November 1970.

Air Quality Display Model (AQDM), National Air Pollution Control Administration, Department of Health, Education, and Welfare, Washington, D.C., November 1969.

(ii) The plan shall contain a summary of emission levels expected to result from application of the control strategy, which summary shall be included in a table similar to that presented in Appendix D to this part.

(iii) The plan shall also show the air quality levels expected to result from application of the control strategy, presented either in tabular form or as an isopleth map showing maximum pollutant concentrations and expected concentration gradients. Computer printouts of the input and output data associated with use of a diffusion model shall be retained and made available for inspection by the Administrator.

(f) Emission data:

(1) Each plan shall include the following data on emissions of sulfur oxides and particulate matter:

(i) For each example region in the State, a detailed inventory of emissions from point sources and area sources in each county shall be summarized in a form similar to that shown in Appendix D, and the data described in Appendices E and F to this part shall be retained and made available for inspection by the Administrator.

(ii) For all regions, point-source and area-source data shall be submitted in summary form, as shown in Appendix G, except that for regions classified as Priority III, only point-source data and any existing area-source data shall be submitted. Data described in Appendices E and F to this part shall be retained and made available for inspection by the Administrator.

(g) Air quality data: Data showing existing air quality with respect to sulfur dioxide and particulate matter shall be submitted for each example region. Actual measurements shall be used where available if based on use of the measurement methods specified in § 420.17; sulfur dioxide measurements based on use of the continuous conductimetric method also will be acceptable for this purpose. If actual measurements are not available and cannot be made in time to be employed in the development of the control strategy, air quality may be estimated by the procedure described in Appendix A to this part. Air quality data, whether measured or estimated, shall be submitted in a form similar to that shown in Appendix H to this part.

§ 420.14 Control strategy: Carbon monoxide, hydrocarbons,, photochemical oxidants, and nitrogen dioxide.

(a) *Priority I Regions.* (1) Each plan for a region classified Priority I with respect to carbon monoxide, photochemical oxidants, or nitrogen dioxide shall set forth a control strategy which shall provide for the degree of emission reduction necessary for attainment and maintenance of the national standard for each such pollutant after consideration of the emission reductions that will result from the application of Federal motor vehicle emission standards promulgated pursuant to section 202 of the Act.

(2) Unless specific data are available for a region, a State shall assume that such Federal motor vehicle emission standards will result in the emission reductions shown in Appendix I to this part. If specific data are used, such data must be submitted in the plan for such region.

(b) *Control strategy development.* In a region in which attainment and maintenance of a national standard will require emission reductions in addition to those which will result from application of the Federal motor vehicle emission standards, the control strategy shall provide for application of such other measures as may be necesary for attainment and maintenance of such national standard.

(c) *Adequacy of control strategy.* (1) The plan shall demonstrate, by means of a proportional model or diffusion/photochemical model or other procedure which is adequate and appropriate, that the control strategy included in each plan for a region classified as Priority I

is adequate for attainment and maintenance of the national standard(s) to which such control strategy applies.

(2) With respect to control of carbon monoxide and nitrogen oxides, the proportional model which may be used for purposes of this paragraph is described in § 420.13(d)(2): *Provided*, With respect to the national standard for nitrogen dioxide, that the degree of air quality improvement indicated to be necessary by the proportional model will be achieved by a corresponding degree of reduction of total nitrogen oxides emissions from stationary and mobile sources.

(3) In any region where the degree of nitrogen oxides emission reduction necessary for attainment and maintenance of the national standard for nitrogen dioxide is greater than that which can be achieved by the application of (i) the Federal motor vehicle emission standards promulgated under section 202 of the Act, (ii) reasonably available control technology to nitrogen oxides sources, and (iii) any transportation control measures which may be necessary for attainment and maintenance of the national standards for carbon monoxide and photochemical oxidants, the plan shall provide for the degree of hydrocarbon emission reduction attainable through the application of reasonably available control technology. In any such region, a control strategy which provides for such hydrocarbon emission reduction shall be deemed adequate for attainment of the national standard for nitrogen dioxide.

(4) With respect to hydrocarbons and photochemical oxidants, it may be assumed that (i) there is no background concentration of photochemical oxidants and (ii) the degree of total hydrocarbon emission reduction necessary for attainment and maintenance of the national standard for photochemical oxidants will also be adequate for attainment of the national standard for hydrocarbons. The proportional model to be used to determine the necessary hydrocarbon emission reduction is set forth in Appendix J to this part.

(5) The plan shall show that the control strategy will result in the degree of emission reduction indicated to be necessary by the proportional model. The plan shall contain a summary of the computations used to determine the emission reductions that will result from application of the control strategy to each point source and each group of area sources. Such summary shall be included in a table similar to that presented in Appendix D to this part. The detailed computations shall be retained by the State agency and made available for inspection by the Administrator.

(6) If a diffusion/photochemical model is used, the plan shall include a description of such model.

(d) *Emission data.* Emission data on carbon monoxide, hydrocarbons, and nitrogen oxides shall be submitted in accordance with the requirements of § 420.13(e).

(e) *Air quality data.* Data showing existing air quality levels shall be presented in accordance with this section:

(1) For Priority I regions, data on carbon monoxide, nitrogen dioxide, and photochemical oxidants shall, as a minimum, include the results of measurements made during a period of approximately 3 months beginning on or about July 1, 1971, in accordance with the following procedures.

Pollutants	Measurement method [1]	Number of sites per region	Frequency of sampling
Carbon monoxide	Nondispersive infrared	One	Continuous.
Nitrogen dioxide	24-hour (gas bubbler) methods (Jacobs-Hochheiser).	do	One 24-hour sample, every 3 days.
Photochemical oxidants	Gas phase chemiluminescence	do	Continuous.

[1] Equivalent methods are specified in § 420.17.

(2) For Priority I regions, only available air quality data for hydrocarbons must be submitted.

(3) For Priority III regions, no air quality data for carbon monoxide, hydrocarbons, nitrogen dioxide, and photochemical oxidants need be submitted.

(4) Air quality data required by this subparagraph shall be submitted in the form similar to that shown in Appendix H to this part.

§ 420.15 Compliance schedules.

(a) (1) Except as otherwise provided in subparagraph (2) of this paragraph, each plan shall contain legally enforceable compliance schedules setting forth the dates by which all stationary and mobile sources or categories of such sources must be in compliance with any applicable portions of the control strategy set forth in such plan.

(2) A plan may provide that a legally enforceable compliance schedule will be negotiated with the owner or operator of an individual source following submittal of the plan. Such compliance schedule shall be submitted to the Administrator as early as possible but in no case later than the prescribed date for submittal of the first semiannual report required by § 420.7. Unless disapproved by the Administrator, such compliance schedule shall be part of the applicable plan.

(b) (1) Any compliance schedule designed to provide for attainment and maintenance of a primary standard shall provide for compliance with applicable portions of the control strategy as expeditiously as practicable and in no case, except as otherwise provided by Subpart C of this part, later than 3 years after the Administrator's approval of the plan, or portion thereof, which sets forth such control strategy.

(2) Any compliance schedule designed to provide for attainment and maintenance of a secondary standard shall provide for compliance with applicable portions of the control strategy in a reasonable time and in no case later than the date specified for attainment of such secondary standard pursuant to § 420.10(c).

(c) Any compliance schedule extending over a period of 18 or more months from the date of its adoption shall provide for periodic increments of progress toward compliance by any affected source(s) or categories of sources.

(d) Except as otherwise provided by Subpart C of this part, neither the State agency nor a local agency shall grant any variance of, or exception to, any compliance schedule included in an applicable plan if such variance or exception will prevent, or interfere with, attainment or maintenance of a national standard within the time(s) specified pursuant to § 420.10 (b) and (c).

§ 420.16 Prevention of air pollution emergency episodes.

(a) For the purpose of preventing air pollution emergency episodes, each plan for a Priority I region shall include a contingency plan which shall, as a minimum, provide for taking any emission control actions necessary to prevent ambient pollutant concentrations at any location in such region from reaching levels which would constitute imminent and substantial endangerment to the health of persons, which levels shall be prescribed by the Administrator.

(b) Each contingency plan shall (1) specify two or more stages of episode criteria such as those set forth in Appendix L to this part, or their equivalent (2) provide for public announcement whenever any episode stage has been determined to exist, and (3) specify emission control actions to be taken at each episode stage, including, but not necessarily limited to, actions such as those set forth in Appendix L to this part, or their equivalent.

(c) (1) For each stationary source emitting 100 tons (90.7 metric tons) per year or more, the contingency plan shall include, or provide for preparation of, a specific legally enforceable emission control action program and shall show that the owner and/or operator of such stationary source has been notified of the requirements of such emission control action program.

(2) Any emission control action programs required by subparagraph (1) of this paragraph which are not included in the contingency plan shall be submitted to the Administrator in the first semiannual report required under § 420.7. Unless disapproved by the Administrator, such emission control action programs shall be part of the applicable plan.

(d) To the maximum extent practicable, emission control actions taken pursuant to a contingency plan shall be consistent with the extent of any air pollution episode, e.g., if a single source is determined to be responsible for the occurrence of any episode stage, then the emission control action steps applicable to such source shall be taken.

(e) Each contingency plan for a Priority I region shall provide for:

(1) Daily acquisition of forecasts of atmospheric stagnation conditions or during any episode stage and updating of such forecasts at least every 12 hours.

(2) Inspection of sources to ascertain compliance with applicable emission control action requirements.

(3) Communications procedures for transmitting status reports and orders as to emission control actions to be taken during an episode stage, including procedures for contact with public officials, major emission sources, public health, safety, and emergency agencies and news media.

(f) In the event that the requirements of paragraphs (c) and (e) of this section have not been fully met by the prescribed date for submitting a plan, a description of the steps under consideration and a timetable for their completion shall be submitted with the plan. Such timetable shall provide for meeting all requirements of paragraphs (c) and (e) of this section within 1 year after such prescribed date. A description of interim actions that will be taken to control emissions during any episode stage which occurs during such 1-year period shall be included.

(g) Each plan for a Priority II region shall include a contingency plan meeting, as a minmum, the requirements of subparagraphs (1) and (2) or paragraph (b) of this section.

§ 420.17 Air quality surveillance.

(a) (1) The plan shall provide for the establishment of an air quality surveillance system which shall be completed and in operation as expeditiously as practicable, but not later than 2 years after the date of the Administrator's approval of the plan, and which shall meet, as a minimum, the following requirements:

Classification of region	Pollutant	Measurement method [i]	Minimum frequency of sampling	Region population	Minimum number of air quality monitoring sites [h]
I	Suspended particulates	High volume sampler	One 24-hour sample every 6 days [a]	Less than 100,000	4.
				100,000–1,000,000	4+0.6 per 100,000 population.[c]
				1,000,001–5,000,000	7.5+0.25 per 100,000 population.[c]
				Above 5,000,000	12+0.16 per 100,000 population.[c]
		Tape sampler	One sample every 2 hours		One per 250,000 population [c] up to eight sites.
	Sulfur dioxide	Pararosaniline or equivalent [d]	One 24-hour sample every 6 days (gas bubbler).[a]	Less than 100,000	3.
				100,000–1,000,000	2.5+0.5 per 100,000 population.[c]
				1,000,001–5,000,000	6+0.15 per 100,000 population.[c]
				Above 5,000,000	11+0.05 per 100,000 population.[c]
			Continuous	Less than 100,000	1.
				100,000–5,000,000	1+0.15 per 100,000 population.[c]
				Above 5,000,000	6+0.05 per 100,000 population.[c]
	Carbon monoxide	Nondispersive infrared or equivalent.[e]	Continuous	Less than 100,000	1.
				100,000–5,000,000	1+1.15 per 100,000 population.[c]
				Above 5,000,000	6+0.05 per 100,000 population.[c]
	Photochemical oxidants	Gas phase chemiluminescence or equivalent.[f]	Continuous	Less than 100,000	1.
				100,000–5,000,000	1+0.15 per 100,000 population.[c]
				Above 5,000,000	6+0.05 per 100,000 population.[c]
	Nitrogen dioxide	24-hour sampling method (Jacobs-Hochheiser method).	One 24-hour sample every 14 days (gas bubbler).[b]	Less than 100,000	3.
				100,000–1,000,000	4+0.6 per 100,000 population.[c]
				Above 1,000,000	10.
II	Suspended particulates	High volume sampler	One 24-hour sample every 6 days [a]		3.
		Tape sampler	One sample every 2 hours		1.
	Sulfur dioxide	Pararosaniline or equivalent [d]	One 24-hour sample every 6 days (gas bubbler).[a]		3.
			Continuous		1.
III[g]	Suspended particulates	High volume sampler	One 24-hour sample every 6 days [a]		1.
	Sulfur dioxide	Pararosaniline or equivalent [d]	One 24-hour sample every 6 days (gas bubbler).[a]		1.

[a] Equivalent to 61 random samples per year.
[b] Equivalent to 26 random samples per year.
[c] Total population of a region. When required number of samplers includes a fraction, round-off to nearest whole number.
[d] Equivalent methods are (1) Gas Chromatographic Separation—Flame Photometric Detection (provided Teflon is used throughout the instrument system in parts exposed to the air stream), (2) Flame Photometric Detection (provided interfering sulfur compounds present in significant quantities are removed), (3) Coulometric Detection (provided oxidizing and reducing interferences such as O_3, NO_2, and H_2S are removed), and (4) the automated Pararosaniline Procedure.
[e] Equivalent method is Gas Chromatographic Separation—Catalytic Conversion—Flame Ionization Detection.
[f] Equivalent methods are (1) Potassium Iodide Colorimetric Detection (provided a correction is made for SO_2 and NO_2), (2) UV Photometric Detection of Ozone (provided compensation is made for interfering substances), and (3) Chemiluminesence Methods differing from that of the reference method.
[g] It is assumed that the Federal motor vehicle emission standards will achieve and maintain the national standards for carbon monoxide, nitrogen dioxide, and photochemical oxidants; therefore, no monitoring sites are required for these pollutants.
[h] In interstate regions, the number of sites required should be prorated to each State on a population basis.
[i] All measurement methods, except the Tape Sampler method, are described in the national primary and secondary ambient air quality standards published in the FEDERAL REGISTER on Apr. 30, 1971 (36 F.R. 8186). Other methods together with those specified under footnotes (d), (e), and (f) will be considered equivalent if they meet the following performance specifications:

Specification	Pollutants		
	Sulfur dioxide	Carbon monoxide	Photochemical oxidant (corrected for NO_2 and SO_2)
Range	0–2,620 μg./m.³ (0–1 p.p.m.)	0–58 mg./m.³ (0–50 p.p.m.)	0–880 μg./m.³ (0–0.5 p.p.m.).
Minimum detectable sensitivity	26 μg./m.³ (0.01 p.p.m.)	0.6 mg./m.³ (0.5 p.p.m.)	20 μg./m.³ (0.01 p.p.m.).
Rise time, 90 percent	5 minutes	5 minutes	5 minutes.
Fall time, 90 percent	5 minutes	5 minutes	5 minutes.
Zero drift	±1 percent per day and ±2 percent per 3 days.	±1 percent per day and ±2 percent per 3 days.	±1 percent per day and ±2 percent per 3 days.
Span drift	±1 percent per day and ±2 percent per 3 days.	±1 percent per day and ±2 percent per 3 days.	±1 percent per day and ±2 percent per 3 days.
Precision	±2 percent	±4 percent	±4 percent.
Operation period	3 days	3 days	3 days.
Noise	±0.5 percent (full scale)	±0.5 percent (full scale)	±0.5 percent (full scale).
Interference equivalent	26 μg./m.³ (0.01 p.p.m.)	1.1 mg./m.³ (1 p.p.m.)	20 μg./m.³ (0.01 p.p.m.).
Operating temperature fluctuation	±5° C	±5° C	±5° C.
Linearity	2 percent (full scale)	2 percent (full scale)	2 percent (full scale).

The various specifications are defined as follows:
Range: The minimum and maximum measurement limits.
Minimum detectable sensitivity: The smallest amount of input concentration which can be detected as concentration approaches zero.
Rise time 90 percent: The interval between initial response time and time to 90 percent response after a step increase in inlet concentration.
Fall time 90 percent: The interval between initial response time and time to 90 percent response after a step decrease in the inlet concentration.
Zero drift: The change in instrument output over a stated time period of unadjusted continuous operation, when the input concentration is zero.
Span drift: The change in instrument output over a stated period of unadjusted continuous operation, when the input concentration is a stated upscale value.
Precision: The degree of agreement between repeated measurements of the same concentration (which shall be the midpoint of the stated range) expressed as the average deviation of the single results from the mean.
Operation period: The period of time over which the instrument can be expected to operate unattended within specifications.
Noise: Spontaneous deviations from a mean output not caused by input concentration changes.
Interference equivalent: The portion of indicated concentration due to the total of the interferences commonly found in ambient air.
Operating temperature fluctuation: The ambient temperature fluctuation over which stated specifications will be met.
Linearity: The maximum deviation between an actual instrument reading and the reading predicted by a straight line drawn between upper and lower calibration points.

(2) At least one sampling site must be located in the area of estimated maximum pollutant concentrations.

(b) The plan shall include a description of the existing and proposed air quality surveillance system, which shall set forth:

(1) The basis for the design of the surveillance system, selection of samplers, and sampling sites.

(2) The locations of the samplers by Universal Transverse Mercator (UTM) grid coordinates or the equivalent. Any EPA monitoring station may be designated as a sampler location.

(3) The sampling schedules.

(4) The methods of sampling and analysis.

(5) The method of data handling and analysis procedures.

(6) The timetable for the installation of any additional equipment needed to complete the system.

(c) The plan shall provide for monitoring of air quality during any air pollution emergency episode stage. The stations selected for use during such periods must be in operation within 1 year after the date of the Administrator's approval of the plan and be capable of indicating when pollutant concentrations have reached, or are approaching, any episode criteria established pursuant to § 420.16.

§ 420.18 Review of new sources and modifications.

(a) Each plan shall set forth legally enforceable procedures that will be used to implement the authority described in § 420.11(a)(4), which procedures shall be adequate to enable the State to determine whether construction or modification of stationary sources will result in violations of applicable portions of the control strategy or will interfere with attainment or maintenance of a national standard.

(b) Such procedures shall provide for the submission, by the owner or operator of a new stationary source, or existing source which is to be modified, of such information on the nature and amounts of emissions, locations, design, construction, and operation of such sources as may be necessary to permit the State agency to make the determination referred to in paragraph (a) of this section.

(c) Such procedures shall also include means of disapproving such construction or modification if it will result in a violation of applicable portions of the control strategy or will interfere with attainment or maintenance of a national standard.

(d) Such procedures shall provide that approval of any construction or modification shall not affect the responsibility of the owner or operator to comply with applicable portions of the control strategy.

§ 420.19 Source surveillance.

(a) Each plan shall provide for monitoring the status of compliance with any rules and regulations which set forth any portion of the control strategy. Specifically, each plan shall, as a minimum, provide for:

(1) Legally enforceable procedures for requiring owners or operators of stationary sources to maintain records of, and periodically report to the State information on, the nature and amount of emissions from such stationary sources and/or such other information as may be necessary to enable the State to determine whether such sources are in compliance with applicable portions of the control strategy.

(2) Periodic testing and inspection of stationary sources.

(3) Establishment of a system for detecting violations of any rules and regulations through the enforcement of appropriate visible emission limitations and for investigating complaints.

(b) As used in this section, "stationary sources" means sources of a class or category which, for purposes of construction or modification, would be subject to procedures established pursuant to § 420.18.

§ 420.20 Resources.

Each plan shall include a description of the resources available to the State and local agencies at the date of submission of the plan and of any additional resources needed to carry out the plan during the 5-year period following its submission. Such description, which shall be provided in a form similar to that in Appendix K to this part, shall include projections of the extent to which resources will be acquired at 1-, 3-, and 5-year intervals.

§ 420.21 Intergovernmental cooperation.

(a) For the purpose of assisting in the development of a plan for any interstate region, the State agency responsible for implementing national standards in any portion of such an interstate region shall furnish any available data on emissions, air quality, and control strategy development, upon request, to any other State or local agency having such responsibility in any other portion of such interstate region.

(b) Each plan shall identify:

(1) The local agencies, by official title, which will participate in carrying out the plan.

(2) The responsibilities of such local agencies and the responsibilities of any State governmental agency involved in carrying out any portion of the plan.

(c) Each plan shall provide assurances that the State agency having primary responsibility for implementing national standards in any region, or portion thereof, will promptly transmit to other State agencies having similar or related responsibility in the same or other States, information on factors (e.g., construction of new industrial plants) which may significantly affect air quality in any portion of such region or in any adjoining region.

§ 420.22 Rules and regulations.

Emission limitations and other measures necessary for attainment and maintenance of any national standard, including any measures necessary to implement the requirements of § 420.11, shall be adopted as rules and regulations enforceable by the State agency. Copies of all such rules and regulations shall be submitted with the plan. Except as otherwise provided by § 420.11(b), submittal of a plan setting forth proposed rules and regulations will not satisfy the requirements of this section nor will it be considered a timely submittal.

Subpart C—Extensions

§ 420.30 Request for 2-year extension.

(a) The Governor of a State may, at the time of submission of a plan to implement a primary standard in a Priority I region, request the Administrator to extend, for a period not exceeding 2 years, the 3-year period prescribed by the Act for attainment of the primary standard in such region.

(b) Any such request regarding an interstate region shall be submitted jointly with the requests of Governors of all States in the region, or shall show that the Governor of each State in the region has been notified of such a request.

(c) Any such request regarding attainment of a primary standard shall be submitted together with a plan which shall:

(1) Set forth a control strategy adequate for attainment of such primary standard.

(2) Show that the necessary technology or alternatives will not be available soon enough to permit full implementation of such control strategy within such 3-year period, i.e., one or more emission sources or classes of sources will be unable to comply with applicable portions of the control strategy.

(3) Provide for attainment of such primary standard as expeditiously as practicable, but in no case later than 5 years after the date of the Administrator's approval of such plan.

(d) Any showing pursuant to paragraph (c) of this section shall include:

(1) A clear identification of stationary emission sources or classes of moving sources which will be unable to comply with the applicable portions of such control strategy within a 3-year period because the necessary technology or alternatives will not be available soon enough to permit such compliance.

(2) A clear identification and justification of any assumptions made with

the respect to the time at which the necessary technology or alternatives will be available.

(3) A clear identification of any alternative means of attainment of such primary standard which were considered and rejected.

(4) A showing that stationary emission sources or classes of moving sources other than those identified pursuant to subparagraph (1) of this paragraph will be required to comply, within such 3-year period, with any applicable portions of such control strategy.

(5) A showing that reasonable interim control measures are provided for in such plan with respect to emissions from the source(s) identified pursuant to subparagraph (1) of this paragraph.

§ 420.31 Request for 18-month extension.

(a) Upon request of the State made in accordance with this section, the Administrator may, whenever he determines necessary, extend, for a period not to exceed 18 months, the deadline for submitting that portion of a plan that implements a secondary standard.

(b) Any such request will be given consideration only in the case of Priority I and Priority II regions.

(c) Any such request shall show that attainment of the secondary standards will require emission reductions exceeding those which can be achieved through the application of reasonably available control technology.

(d) Any such request for extension of the deadline with respect to any State's portion of an interstate region shall be submitted jointly with requests for such extensions from all other States within the region or shall show that all such States have been notified of such request.

(e) Any such request shall be submitted sufficiently early to permit development of a plan prior to the deadline in the event that such request is denied.

§ 420.32 Request for 1-year postponement.

(a) Pursuant to section 110(f) of the Act, the Governor of a State may request, with respect to any stationary source or class of moving sources, a postponement for not more than 1 year of the applicability of any portion of the control strategy.

(b) Any such request regarding sources located in an interstate region shall show that the Governor of each State in the region has been notified of such request.

(c) Any such request shall clearly identify the source(s) and portion(s) of the control strategy which are the subject of such request and shall include information relevant to the determinations required by section 110(f) of the Act.

(d) A public hearing will be held, before the Administrator or his designee, on any such request. No such hearing will be held earlier than 1 year in advance of the prescribed date for compliance with any such portion(s) of the control strategy.

(e) No such request shall operate to stay the applicability of the portion(s) of the control strategy covered by such request.

(f) A State's determination to defer the applicability of any portion(s) of the control strategy with respect to such source(s) will not necessitate a request for postponement under this section unless such deferral will prevent attainment or maintenance of a national standard within the time specified in such plan: *Provided, however,* That any such determination will be deemed a revision of an applicable plan under § 420.6.

APPENDIX A—AIR QUALITY ESTIMATION

Ambient pollutant levels may be estimated through the application of atmospheric diffusion models. These estimates are based primarily upon the pollutant emissions, meteorology, and topography that prevails within a region. Several procedures are available for estimating air quality based on atmospheric dispersion. The complexity and sophistication of these procedures range from a few simple calculations that may be made manually to thousands of calculations that require a computer. The procedures presented here are simple and require a minimum of calculations. The two procedures presented are referred to as an area model and a point model. The area model was used to classify regions not having air quality data where the air quality levels are the result of several pollutant sources distributed throughout the region. The point model was used where the air quality results from a single point source of pollutant.

Area model. The relationship presented in figure 1 is based on the concepts of the model developed by Miller and Holzworth.[1] This model requires estimates of a region's average emission density, the "size" of the region, and the wind speed through the atmospheric mixing layer. A summary and description of how to use the procedure are presented here.

For discussion purposes let:

X = Estimate concentration, micrograms/cubic meter ($\mu g/m^3$)

μ = Wind speed through mixing layer, meters/second (m/s)

Q = Emission density, micrograms/square meter-second ($\mu g/m^2$-s)

C = Urban size = $\frac{1}{2}\sqrt{\text{urban area}}$, kilometers (km.)

Figure 1 is a plot of "normalized concentration" ( ) as a function of urban size and is defined to be the product of predicted concentration and wind speed divided by emission density. Concentrations are an increasing function of urban size and are directly proportional to emission density. The wind serves as a diluting agent and reduces expected pollutant concentrations.

As an example, the Standard Metropolitan Statistical Area (SMSA) of Chicago is used to compute the expected concentration of SO_2 from 1967 emissions in the Chicago area. The urban area of Chicago for computational purposes is 2,500 square km. The urban size, as defined is consequently 25 km. and thus from figure 1:

$$\frac{X\mu}{Q} = 230$$

For Chicago:

$$Q = 17.8 \ \frac{\mu g/sec}{meter^2}$$

$$\mu = 7.3 \text{ meters/sec}$$

and hence:

$$X = \frac{(230)(17.8)}{7.3} = 561 \ \mu g/m^3$$

Using this procedure, concentration estimates for both SO_2 and particulate matter may be made on a regional basis. These predicted air quality concentrations may be used to establish region classification.

Point Model. The ambient air quality concentrations that result from the emissions of a single point source have a large degree of variability depending upon the meteorological conditions. Because of this, the short-term air quality concentrations are of more concern than the long-term. In many cases, the short-term maximum concentrations occur when the plume is trapped in a mixing layer of limited depth. In these cases, the 1-hour ground level concentration from a single point source may be estimated from the following equation: [2]

$$X = \frac{Q}{\sqrt{2\pi}\sigma_y L u} \exp\left[-\frac{1}{2}\left(\frac{y}{\sigma_y}\right)^2\right]$$

where:

X = concentration, gm/meter ^{3}.

Q = source emission rate, gm/sec.

σ_y = the standard deviation in the cross-wind direction of the plume concentration distribution, meters.

L = height of the mixing layer, meters.

u = wind speed, meters/sec.

y = cross wind distance, meters.

The values of the meteorological parameters must be based on the meteorological conditions in the vicinity of the source. Multiplying the estimated maximum 1-hour concentration by 0.25 may be used to estimate a maximum 24-hour concentration. This factor is deemed appropriate for the meteorological conditions to which the above equation applies. The factor implies that the meteorological conditions persist 6 hours of a 24-hour period. During the remaining 18 hours, wind direction and other meteorological parameters are such that the source has no impact upon the location subjected to contamination during the 6-hour period. The estimated maximum 24-hour concentration may be compared to the maximum 24-hour national standards. This procedure may be used in Priority 1A regions to estimate the existing air quality levels for developing a control strategy.

Under certain source and meteorological conditions, the above equation may not be appropriate; however, other equations [2] are available that may be used.

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[1] Miller, M.E., and Holzworth, G.C., "An Atmospheric Diffusion Model for Metropolitan Areas", Jour. Air Poll. Cont. Assoc., 17: 46–50; Jan. 1967.

[2] Turner, D. B., "Workbook of Atmospheric Dispersion Estimates", Public Health Service Publication No. 999–AP–26, U.S. Department of Health, Education, and Welfare, Public Health Service, Consumer Protection and Environmental Health Service, National Air Pollution Control Administration, Cincinnati, Ohio. Revised 1969.

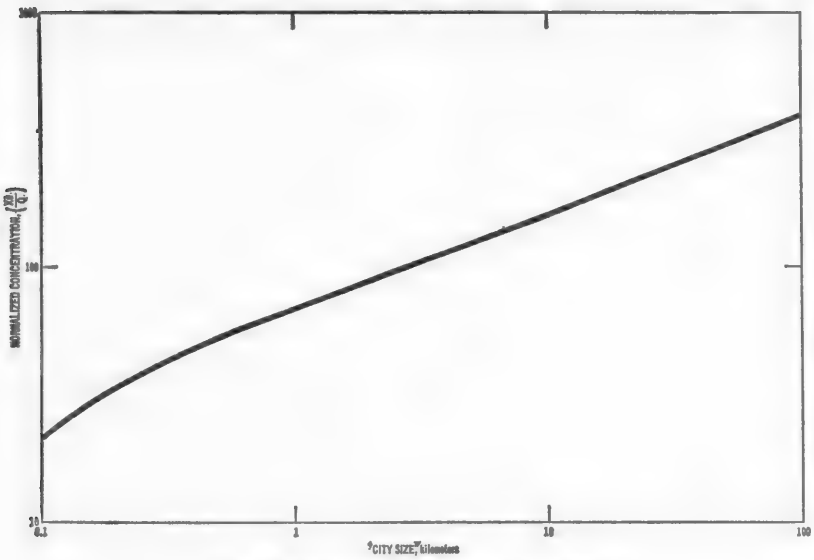

Figure 1. Relationship of normalized pollutant concentration and city size.

APPENDIX B—EXAMPLES OF EMISSION LIMITATIONS ATTAINABLE WITH REASONABLY AVAILABLE TECHNOLOGY

This appendix sets forth emission limitations which, in the Administrator's judgment, are attainable through the application of reasonable available emission control technology. The statements presented herein are not intended, and should not be construed, to require or encourage State agencies to adopt such emission limitations without consideration of (1) the necessity of imposing such emission limitations in order to attain and maintain a national standard, (2) the social and economic impact of such emission limitations, and (3) alternative means of providing for attainment and maintenance of a national standard. Failure of a State agency to adopt any or all of the emission limitations set forth herein will not be grounds for rejecting a State implementation plan if that implementation plan provides for attainment and maintenance of the National Ambient Air Quality Standards within the time prescribed by the Clean Air Act. Nor will State adoption of any or all of these emission limitations be grounds for approval of an implementation plan that does not provide for timely attainment and maintenance of the national standards. In preparing implementation plans, State agencies should tailor their control strategies to deal with the particular problems and meet the particular needs of their own States.

1.0 DEFINITIONS

"Air pollutant" means dust, fumes, mist, smoke, other particulate matter, vapor, gas, odorous substances, or any combination thereof.

"Effluent water separator" means any tank, box, sump, or other container in which any volatile organic compound floating on or entrained or contained in water entering such tank, box, sump, or other container is physically separated and removed from such water prior to outfall, drainage, or recovery of such water.

"Emission" means the act of releasing or discharging air pollutants into the ambient air from any source.

"Fuel-burning equipment" means any furnace, boiler, apparatus, stack, and all appurtenances thereto, used in the process of burning fuel for the primary purpose of producing heat or power by indirect heat transfer.

"Fugitive dust" means solid, airborne particulate matter emitted from any source other than through a stack.

"Opacity" means a state which renders material partially or wholly impervious to rays of light and causes obstruction of an observer's view.

"Particulate matter" means any material, except water in uncombined form, that is or has been airborne and exists as a liquid or a solid at standard conditions.

"Ringelmann chart" means the chart published and described in the U.S. Bureau of Mines Information Circular 8333.

"Source" means any property, real or personal, which emits or may emit any air pollutant.

"Stack" means any chimney, flue, conduit, or duct arranged to conduct emissions to the ambient air.

"Standard conditions" mean a dry gas temperature of 70° Fahrenheit and a gas pressure of 14.7 pounds per square inch absolute.

"Submerged fill pipe" means any fill pipe the discharge opening of which is entirely submerged when the liquid level is 6 inches (15 cm.) above the bottom of the tank; or when applied to a tank which is loaded from the side, means any fill pipe the discharge opening of which is entirely submerged when the liquid level is 18 inches (45 cm.) above the bottom of the tank.

"Volatile organic compounds" means any compound containing carbon and hydrogen or containing carbon and hydrogen in combination with any other element which has a vapor pressure of 1.5 pounds per square inch absolute (77.6 mm. Hg) or greater under actual storage conditions.

2.0 CONTROL OF PARTICULATE EMISSIONS

2.1 *Visible emissions.* The emission of visible air pollutants can be limited to a shade or density equal to but not darker than that designated as No. 1 on the Ringelmann chart or 20 percent opacity except for brief periods during such operations as soot blowing and startup. This limitation would generally eliminate visible pollutant emissions from stationary sources.

The emission of visible air pollutants from gasoline-powered motor vehicles can be eliminated except for periods not exceeding 5 consecutive seconds. The emission of visible air pollutants from diesel-powered motor vehicles can be limited to a shade or density equal to but not darker than that designated as No. 1 on the Ringelmann chart or 20 percent opacity except for periods not exceeding 5 consecutive seconds.

2.2 *Fugitive dust.* Reasonable precautions can be taken to prevent particulate matter from becoming airborne. Some of these reasonable precautions include the following:

(a) Use, where possible, of water or chemicals for control of dust in the demolition of existing buildings or structures, construction operations, the grading of roads or the clearing of land;

(b) Application of asphalt, oil, water, or suitable chemicals on dirt roads, materials stockpiles, and other surfaces which can give rise to airborne dusts;

(c) Installation and use of hoods, fans, and fabric filters to enclose and vent the handling of dusty materials. Adequate containment methods can be employed during sandblasting or other similar operations;

(d) Covering, at all times when in motion, open bodied trucks, transporting materials likely to give rise to airborne dusts;

(e) Conduct of agricultural practices such as tilling of land, application of fertilizers, etc., in such manner as to prevent dust from becoming airborne;

(f) The paving of roadways and their maintenance in a clean condition;

(g) The prompt removal of earth or other material from paved streets onto which earth or other material has been transported by trucking or earth moving equipment, erosion by water, or other means.

2.3 *Incineration.* The emission of particulate matter from any incinerator can be limited to 0.20 pound per 100 pounds (2 gm/kg.) of refuse charged. This emission limitation is based on the source test method for stationary sources of particulate emissions which will be published by the Administrator. This method includes both a dry filter and wet impingers and represents particulate matter of 70° F. and 1.0 atmosphere pressure.

2.4 *Fuel burning equipment.* The emission of particulate matter from fuel burning equipment burning solid fuel can be limited to 0.30 pound per million B.t.u. (0.54 gm/10^6 gm-cal) of heat input. This emission limitation is based on the source test method for stationary sources of particulate emissions which will be published by the Administrator. This method includes both a dry filter and wet impingers and represents particulate matter of 70° F. and 1.0 atmosphere pressure.

2.5 *Process industries—general.* The emission of particulate matter for any process source can be limited in a manner such as in table I. Process weight per hour means the total weight of all materials introduced into any specific process that may cause any emission of particulate matter. Solid fuels charged are considered as part of the process weight, but liquid and gaseous fuels and combustion air are not. For a cyclical or batch operation, the process weight per hour is derived by dividing the total process weight by the number of hours in one complete operation from the beginning of any given process to the completion thereof, excluding any time during which the equipment is idle. For a continuous operation, the process weight per hour is derived by dividing the process weight for a typical period of time.

TABLE I

Process weight rate (lbs./hr.)	Emission rate (lbs./hr.)
50	0.08
100	0.55
500	1.53
1,000	2.25
5,000	6.34
10,000	9.73
20,000	14.99
60,000	29.60
80,000	31.19
120,000	33.28
160,000	34.85
200,000	36.11
400,000	40.35
1,000,000	46.72

Interpolation of the data in table I for the process weight rates up to 60,000 lbs./hr. shall be accomplished by the use of the equation:

$$E=3.59\,P^{0.62} \quad P\leq 30 \text{ tons/hr.}$$

and interpolation and extrapolation of the data for process weight rates in excess of 60,000 lbs./hr. shall be accomplished by use of the equation:

$$E=17.31\,P^{0.16} \quad P>30 \text{ tons/hr.}$$

Where: E=Emissions in pounds per hour.
P=Process weight rate in tons per hour.

Application of mass emission limitations on the basis of all similar units at a plant is recommended in order to avoid unequal application of this type of limitation to plants with the same total emission potential but different size units.

3.0 CONTROL OF SULFUR COMPOUND EMISSIONS

3.1 *Fuel combustion.* It is not possible to make nationally applicable generalizations about attainable degrees of control of sulfur oxides emissions from combustion sources. Availability of low-sulfur fuels varies from one area to another. In some areas, severe restrictions on the sulfur content of fuels could have a significant impact on fuel-supply patterns; accordingly, where such restrictions are necessary for attainment of national ambient air quality standards, adoption of phased schedules of sulfur-in-fuel limitations is recommended. Stack gas cleaning is feasible at large industrial combustion sources and steam electric power plants. Technology has been demonstrated which will allow 70 percent removal of sulfur oxides from combustion gases of most existing fuel burning units.

Alternative means of meeting requirements for the control of sulfur oxides emissions from fuel combustion sources include: Use of natural gas, distillate oil, low-sulfur coal, and low-sulfur residual oil; desulfurization of oil or coal; stack gas desulfurization; and restricted use, shutdown, or relocation of large existing sources.

It is technically feasible to produce or desulfurize fuels to meet the following specifications: Distillate oil—0.1 percent sulfur (though it should be noted that distillate oil containing less than 0.2 percent sulfur is not generally available at this time); residual oil—0.3 percent sulfur; bituminous coal—0.7 percent sulfur. Availability of significant quantities of such low-sulfur fuels in any region where they do not naturally occur or have not been imported from other domestic or foreign sources will require planning for the timely development of new sources of such fuels. Because residual oil generally is obtained from overseas sources, its use ordinarily is restricted to areas accessible to waterborne transportation. There are limited tonnages of 0.7 percent sulfur coal produced at the present time, primarily in the western United States; large reserves of such coal exist but are not now being mined.

The flaring or combustion of any refinery process gas stream or any other process gas stream that contains sulfur compounds measured as hydrogen sulfide can be limited to a concentration of 10 grains per 100 standard cubic feet (23 gm/100scm) of gas. This limitation on combustion of process gas relates to the control of sulfur oxide emissions that would result from burning untreated process gas from refinery operations or coke ovens containing hydrogen sulfide and other sulfur compounds. Hydrogen sulfide emissions can be controlled by requiring incineration or other equally effective means for all process units. Approximately 95 to 99 percent of the sulfur compounds must be removed from the process gas stream to meet this emission limitation. It may be appropriate to consider exemption of very small units which economically may not be able to achieve this level of control.

3.2 *Sulfuric acid plants.* The emissions of sulfur dioxide from sulfuric acid plants can be limited to 6.5 pounds per ton (3.25 kg./metric ton) of 100 percent acid produced. This emission limitation is equivalent to an overall SO_2 to SO_3 conversion efficiency of 99.5 percent or a stack gas concentation of about 250 to 550 p.p.m. of sulfur dioxide, by volume, depending on the strength of the feed gas.

3.3 *Sulfur recovery plants.* The emission of sulfur oxides, calculated as sulfur dioxide, from a sulfur recovery plant can be limited to 0.01 pound (kg.) per pound (kg.) of sulfur processed. Approximately 99.5 percent of the sulfur processed must be recovered to meet this limitation. Existing plants typically recover 90 to 97 percent of the sulfur. This emission limitation corresponds to a sulfur dioxide concentration of about 1,300 p.p.m., by volume.

3.4 *Nonferrous smelters.* Technology is available to limit emission of sulfur oxides, calculated as sulfur dioxide, from primary nonferrous smelters according to the following equations:

Copper smelters: $Y=0.2X$.
Zinc smelters: $Y=0.564X^{0.85}$.
Lead smelters: $Y=0.98X^{0.77}$.

Where:

X=Total sulfur fed to smelter (lb./hr.).
Y=Sulfur Dioxide Emissions (lb./hr.).

These emission limitations are equivalent to removal of about 90 percent of the input-sulfur to the smelter for most copper smelters and somewhat higher for most lead and zinc smelters. Technology capable of achieving such emission limitations may not be applicable to all existing smelters. In such cases, less restrictive control can be coupled with restricted operations to achieve air quality standards.

3.5 *Sulfite pulp mills.* The total sulfite pulp mill emissions of sulfur oxides, calculated as sulfur dioxide, from blow pits, washer vents, storage tanks, digester relief, and recovery system, can be reduced to 9 pounds per air-dried ton (4.5 kg./metric ton) of pulp produced. This emission limitation has application only to those sulfite mills that install waste liquor recovery systems for water pollution control or other purposes. The installation of a recovery system can result in significant sulfur oxides emissions if not properly designed. For sulfite mills with existing recovery systems, a sulfur oxides emission limitation of 20 pounds per air-dried ton (9 kg./metric ton) of pulp may be more reasonable due to economic considerations.

4.0 CONTROL OF ORGANIC COMPOUNDS EMISSIONS

The following emission limitations are applicable to the principal stationary source of organic compound emissions. Reducing total organic compound emissions will reduce photochemical oxidant formation. Such control of organic compound emissions may appropriately be considered in areas where application of the Federal motor vehicle emission standards will not produce the emission reductions necessary for attainment and maintenance of the national ambient air quality standards for photochemical oxidants. These emission limitations emphasize reduction of total organic compound emissions, rather than substitution of "nonreactive" or "less reactive" organic compounds for those already in use, because there is evidence that very few organic compounds are photochemically nonreactive. Substitution may be useful, however, where it would result in a clearly evident decrease in reactivity and thus tend to reduce photochemical oxidant formation. The extent to which application of these emission limitations would reduce photochemical oxidant formation in a given air quality control region will depend on the "mix" of emission sources in the region. These limitations are separable, i.e., one or more portions can be considered, as necessary.

4.1 *Storage of volatile organic compounds.* The storage of volatile organic compounds in any stationary tank, reservoir or other container of more than 40,000 gallons (150,000 liters) can be in a pressure tank capable of maintaining working pressures sufficient at all times to prevent vapor or gas loss to the atmosphere. If this cannot be done, the tank can be equipped with a vapor loss control device such as:

(a) A floating roof, consisting of a pontoon type, double deck type roof or internal floating cover, which will rest on the surface of the liquid contents and be equipped with a closure seal or seals to close the space between the roof edge and tank wall. This control equipment may not be appropriate if the volatile organic compounds have a vapor pressure of 11 pounds per square inch absolute (568 mm. Hg) or greater under actual storage conditions. All tank gauging or sampling devices can be gas-tight except when tank gauging or sampling is taking place.

(b) A vapor recovery system, consisting of a vapor gathering system capable of collecting the volatile organic compound vapors and gases discharged, and a vapor disposal system capable of processing such volatile organic vapors and gases so as to prevent their emission to the atmosphere and all tank gauging and sampling devices can be gas-tight except when gauging or sampling is taking place.

The storage of any volatile organic compound in any stationary storage vessel more than 250-gallon (950 liter) capacity can be in a vessel equipped with a permanent submerged fill pipe or fitted with a vapor recovery system. This emission limitation will reduce volatile organic emissions 90 to 100 percent from uncontrolled sources of storage in vessels 40,000 gallon capacity or greater and approximately 40 percent from uncontrolled sources of storage in vessels 250 gallon capacity or greater.

4.2 *Volatile organic compounds loading facilities.* The loading of volatile organic compounds into any tank, truck, or trailer having a capacity in excess of 200 gallons (760 liters) can be from a loading facility equipped with a vapor collection and disposal system. Also, the loading facility can be equipped with a loading arm with a vapor collection adaptor, pneumatic, hydraulic or other mechanical means to force a vapor-tight seal between the adaptor and the hatch. A means can be provided to prevent drainage of liquid organic compounds from the loading device when it is removed from the hatch of any tank, truck, or trailer, or to accom-

plish complete drainage before the removal. When loading is effected through means other than hatches, all loading and vapor lines can be equipped with fittings which make vapor-tight connections and which close automatically when disconnected. This emission limitation will result in 55 to 60 percent reduction in volatile organic emissions from uncontrolled sources in gasoline marketing and other organic transfer operations.

4.3 *Volatile organic compounds water separation.* Single or multiple compartment volatile organic compounds water separators which receive effluent water containing 200 gallons (760 liters) a day or more of any volatile organic compound from any equipment processing, refining, treating, storing or handling volatile organic compounds having a Reid vapor pressure of 0.5 pound or greater can be equipped with one of the following vapor loss control devices, properly installed in good working order and in operation:

(a) A container having all openings sealed and totally enclosing the liquid contents. All gauging and sampling devices can be gas-tight except when gauging or sampling is taking place.

(b) A container equipped with a floating roof, consisting of a pontoon type, double deck type roof, or internal floating cover, which will rest on the surface of the contents and be equipped with a closure seal or seals to close the space between the roof edge and container wall. All gauging and sampling devices can be gas-tight except when gauging or sampling is taking place.

(c) A container equipped with a vapor recovery system consisting of a vapor gathering system capable of collecting the organic vapors and gases discharged and a vapor disposal system capable of processing such organic vapors and gases so as to prevent their emission to the atmosphere and with all container gauging and sampling devices gas-tight except when gauging or sampling is taking place. This emission limitation will reduce organic compound emissions from uncontrolled waste water separator units approximately 95 to 100 percent.

4.4 *Pumps and compressors.* All pumps and compressors handling volatile organic compounds can be equipped with mechanical seals or other equipment of equal efficiency.

4.5 *Waste gas disposal.* Any waste gas stream containing organic compounds from any ethylene producing plant or other ethylene emission source can be burned at 1,300° F. (704° C.) for 0.3 second or greater in a direct-flame afterburner or an equally effective device. This does not apply to emergency reliefs and vapor blowdown systems. The emission of organic compounds from a vapor blowdown system or emergency relief can be burned by smokeless flares, or an equally effective control device. This emission limitation will reduce organic compound emissions approximately 98 percent.

4.6 *Organic solvents.* The emission of organic compounds of more than 3 pounds (1.3 kg.) per hour or 15 pounds (6.8 kg.) per day from any equipment can be reduced by at least 85 percent. This can be accomplished by:

(a) Incineration, provided that 90 percent or more of the carbon in the organic compounds being incinerated is oxidized to carbon dioxide, or

(b) Carbon adsorption: This limitation can be applied to a variety of solvent users including industrial surface coatings, dry cleaning, degreasing and printing operations. Surface coating operations may appropriately be exempted from this limitation when the coating's solvent makeup is water-based and does not exceed 20 percent of organic compounds by volume. Organic solvents which have been shown to be virtually unreactive in the formation of oxidants, e.g., saturated halogenated hydrocarbons, perchloroethylene, benzene, acetone, and C_1-C_5 n-paraffins also may be considered for exemption. Other compounds which have been shown to have low reactivity include cyclohexanone, ethyl acetate, diethylamine, isobutyl acetate, isopropyl alcohol, methyl benzoate, 2-nitropropane, phenyl acetate and triethylamine. This emission limitation may impose an economic burden upon some paint spray booth installations. If such sources are not major contributors to hydrocarbon pollution levels, they may appropriately be considered for exemption.

4.7 *Architectural coatings for buildings.* The emission of organic compounds from architectural coatings can be reduced by requiring the use of water-base or other coatings having an organic solvent content of less than 20 percent by volume. The effectiveness of the limitations set forth in §§ 4.6 and 4.7 will vary, depending on the nature and amounts of emissions in an area; a rough estimate based on Los Angeles emission data indicates that application of the limitation would result in a 70 percent reduction in organic solvent emissions. In estimating the effectiveness, it should be assumed that all organic emissions are reactive; use of exempt solvents as substitutes for regulated solvents may be considered 100 percent effective in reducing reactive organic solvent emissions.

5.0 CONTROL OF CARBON MONOXIDE EMISSIONS

The emissions of carbon monoxide can be limited by requiring complete secondary combustion of waste gas generated in such operations as a grey iron cupola, blast furnace, basic oxygen steel furnace, catalyst regeneration of a petroleum cracking system, petroleum fluid coker or other petroleum process.

6.0 CONTROL OF NITROGEN OXIDES EMISSIONS

6.1 *Fuel burning equipment.* The emission of nitrogen oxides, calculated as nitrogen dioxide, from gas-fired fuel burning equipment can be limited to 0.2 pound per million B.t.u. (0.36 gm/10^6 gm-cal) of heat input. This emission limitation is about equivalent to a nitrogen dioxide concentration of 175 p.p.m., by volume, on a dry basis at 3 percent oxygen and represents about a 50 percent reduction in nitrogen oxide emissions from uncontrolled gas-fired equipment.

The emission of nitrogen oxides, calculated as nitrogen dioxide, from oil-fired fuel burning equipment can be limited to 0.30 pound per million B.t.u. (0.54 gm/10^6 gm-cal) of heat input. This emission limitation is about equivalent to a nitrogen dioxide concentration of 230 p.p.m., by volume, on a dry basis, at 3 percent oxygen and represents about a 50 percent reduction in nitrogen oxide emissions from uncontrolled oil-fired fuel burning equipment.

6.2 *Nitric acid manufacture.* The emission of nitrogen oxides, calculated as nitrogen dioxide, from nitric acid manufacturing plants can be limited to 5.5 pounds per ton (2.8 kg./metric ton) of 100 percent acid produced. This emission limitation is about equivalent to a nitrogen dioxide concentration of 400 p.p.m., by volume.

APPENDIX C—MAJOR POLLUTANT SOURCES

CHEMICAL PROCESS INDUSTRIES

Adipic acid.
Ammonia.
Ammonium nitrate.
Carbon black.[1]
Charcoal.[1]
Chlorine.
Detergent and soap.[1]
Explosives (TNT and nitrocellulose).[1]
Hydrofluoric acid.[1]
Nitric acid.
Paint and varnish manufacturing.[1]
Phosphoric acid.[1]
Phthalic anhydride.
Plastics manufacturing.[1]
Printing ink manufacturing.[1]
Sodium carbonate.[1]
Sulfuric acid.[1]
Synthetic fibers.
Synthetic rubber.
Terephthalic acid.

FOOD AND AGRICULTURAL INDUSTRIES

Alfalfa dehydrating.[1]
Ammonium nitrate.
Coffee roasting[1]
Cotton ginning.[1]
Feed and grain.[1]
Fermentation processes.
Fertilizers.[1]
Fish meal processing.
Meat smoke houses.[1]
Starch manufacturing.[1]
Sugar cane processing.[1]

METALLURGICAL INDUSTRIES

Primary metals industries:
- Aluminum ore reduction.[1]
- Copper Smelters.[1]
- Ferroalloy production.[1]
- Iron and steel mills.[1]
- Lead smelters.[1]
- Metallurgical coke manufacturing.[1]
- Zinc.[1]

Secondary metals industries:
- Aluminum operations.[1]
- Brass and bronze smelting.[1]
- Ferroalloys.[1]
- Gray iron foundries.[1]
- Lead smelting.[1]
- Magnesium smelting.[1]
- Steel foundries.[1]
- Zinc processes.[1]

MINERAL PRODUCTS INDUSTRIES

Asphalt roofing.[1]
Asphaltic concrete batching.[1]
Bricks and related clay refractories.[1]
Calcium carbide.[1]
Castable refractories.[1]
Cement.[1]
Ceramic and clay processes.[1]
Clay and fly ash sintering.[1]
Coal cleaning.[1]
Concrete batching.[1]
Fiberglass manufacturing.[1]
Frit manufacturing.[1]
Glass manufacturing.[1]
Gypsum manufacturing.[1]
Lime manufacturing.[1]
Mineral wool manufacturing.[1]
Paperboard manufacturing.[1]
Perlite manufacturing.[1]
Phosphate rock preparation.[1]
Rock, gravel, and sand quarrying and processing.[1]

PETROLEUM REFINING AND PETROCHEMICAL OPERATIONS[1]

WOOD PROCESSING[1]

PETROLEUM STORAGE (Storage tanks and bulk terminals)

MISCELLANEOUS

Fossil fuel steam electric powerplants.[1]
Municipal or equivalent incinerators.[1]
Open burning dumps.[1]

[1] Major sources of sulfur oxides and/or particulate matter.

APPENDIX D—(POLLUTANT) EMISSIONS INVENTORY SUMMARY, TONS/YR. (OR METRIC TONS/YR.) (EXAMPLE REGIONS)

..... AIR QUALITY CONTROL REGION

DATA REPRESENTATIVE OF CALENDAR YEAR ...

Source category		State A				State B [1]				
	County 1		.....	.....	County N		State region total		Ditto	Region [1] total	
	[II]	[III]	[II]	[III]	[II]	[III]	[II]	[III]	Ditto	[II]	[III]
I. Fuel combustion—stationary sources:											
A. Residential fuel:											
1. Anthracite coal:											
a. Area sources											
b. Point sources											
2. Bituminous coal:											
a. Area sources											
b. Point sources											
3. Distillate oil:											
a. Area sources											
b. Point sources											
4. Residual oil:											
a. Area sources											
b. Point sources											
5. Natural gas:											
a. Area sources											
b. Point sources											
6. Wood:											
a. Area sources											
b. Point sources											
7. Other (specify):											
a. Area sources											
b. Point sources											
8. Total											
B. Commercial and institutional fuel:											
1. Anthracite coal:											
a. Area sources											
b. Point sources											
2. Bituminous coal:											
a. Area sources											
b. Point sources											
3. Distillate oil:											
a. Area sources											
b. Point sources											
4. Residual oil:											
a. Area sources											
b. Point sources											
5. Natural Gas:											
a. Area sources											
b. Point sources											
6. Wood:											
a. Area sources											
b. Point sources											
7. Other (specify):											
a. Area sources											
b. Point sources											
8. Total											
C. Industrial fuel:											
1. Anthracite coal:											
a. Area sources											
b. Point sources											
2. Bituminous coal:											
a. Area sources											
b. Point sources											
3. Coke:											
a. Area sources											
b. Point sources											
4. Distillate oil:											
a. Area sources											
b. Point sources											
5. Residual oil:											
a. Area sources											
b. Point sources											

See footnotes at end of table.

APPENDIX D—(POLLUTANT) EMISSIONS INVENTORY SUMMARY, TONS/YR. (EXAMPLE REGIONS AND WHERE EMISSION LIMITATIONS ARE DEVELOPED)—Continued

Source category		State A				State B [1]				
	County 1		.....	.....	County N		State region total		Ditto	Region [1] total	
	[II]	[III]	[II]	[III]	[II]	[III]	[II]	[III]	Ditto	[II]	[III]
I. Fuel combustion—stationary sources—Continued											
C. Industrial fuel—Continued											
6. Natural gas:											
a. Area sources											
b. Point sources											
7. Process gas:											
a. Area sources											
b. Point sources											
8. Other (specify):											
a. Area sources											
b. Point sources											
9. Total											
D. Steam-electric power plant fuel (point sources only):											
1. Anthracite coal											
2. Bituminous coal											
3. Coke											
4. Distillate oil											
5. Residual oil											
6. Natural gas											
7. Process gas											
8. Other (specify)											
9. Total											
E. Total stationary fuel combustion											
II. Process losses:											
A. Area sources [V]											
B. Point sources											
1. Chemical process industries											
2. Food and agricultural industries											
3. Metallurgical industries											
4. Mineral products industries											
5. Petroleum refining and petrochemical operations											
6. Wood processing											
7. Petroleum storage											
C. Total process losses											
III. Solid waste disposal:											
A. Incineration:											
1. On-site:											
a. Area sources											
b. Point sources											
2. Municipal, etc.:											
a. Area sources											
b. Point sources											
B. Open burning:											
1. On-site:											
a. Area sources											
b. Point sources											
2. Dumps:											
a. Area sources											
b. Point sources											
C. Other (specify):											
1. Area sources											
2. Point sources											
D. Total solid waste disposal.											

APPENDIX D—(POLLUTANT) EMISSIONS INVENTORY SUMMARY, TONS/YR. (EXAMPLE REGIONS AND WHERE EMISSION LIMITATIONS ARE DEVELOPED)—Continued

Source category	State A						State B [1]				
	County 1		------	------	County N		State region total		Ditto	Region [1] total	
	[ii]	[iii]	[ii]	[iii]	[ii]	[iii]	[ii]	[iii]	Ditto	[ii]	[iii]
IV. Transportation (area sources only):											
A. Motor vehicles:											
1. Gasoline powered [v]											
2. Diesel powered											
B. Off-highway fuel usage											
C. Aircraft											
D. Railroads											
E. Vessels											
F. Gasoline handling evaporative losses [vi]											
G. Other (specify)											
H. Total transportation											
V. Miscellaneous (area sources only):											
A. Forest fires											
B. Structural fires											
C. Coal refuse burning											
D. Agricultural burning											
E. Other (specify)											
F. Total miscellaneous											
VI. Grand totals											
A. Area sources											
B. Point sources											
C. Total											

[i] Included only if interstate region.
[ii] "Existing Emissions".
[iii] "Emissions Achieved" with control regulations of implementation plans. Must be submitted in example regions.
[iv] For hydrocarbons only, would include emissions or surface coating operations, dry cleaning, degreasing operations, etc., unless considered point sources.
[v] For hydrocarbons, would include vehicle evaporative losses.
[vi] For hydrocarbons only, would include losses from filling tank trucks, service station tanks, and automobile tanks.

APPENDIX E—POINT SOURCE DATA

(The following information is not required to be submitted with an implementation plan but must be available for inspection by the Administrator, EPA.)

I. GENERAL SOURCE INFORMATION

A. Establishment name and address.
B. Person to contact on air pollution matters and telephone number.
C. Operating schedule:
1. Percent of annual production by season.
2. Days of week normally in operation.
3. Shifts or hours of day normally in operation.
4. Number of days per year in operation.
D. Year in which data are recorded.
E. Future activities, if available (e.g., addition of new or expansion of existing facilities, changes in production rate, installation of control equipment, phasing out of equipment, fuel change, etc.).
F. Map or general layout of large complex plants showing locations of various facilities, if available.[1]

II. FUEL COMBUSTION

A. Number of boilers.
B. Type of fuel burning equipment for each boiler.
C. Rated and/or maximum capacity of each boiler, 10^6 B.t.u./hr. or kcal/hr.
D. Types of fuel burned, quantities, and characteristics:
1. Type of each fuel used and place of origin.
2. Maximum and average quantity per hour.
3. Quantity per year.
4. Sulfur content (as received), percent.
5. Ash content (as received), percent.
6. Heat content (as received), B.t.u. or kcal/unit of measure.
7. Estimate of future usage, if available.
E. Percent used for space heating and process heat.
F. Air pollution control equipment (existing and proposed):
1. Type.
2. Collection efficiency (design and actual), percent.
G. Stack data:
1. List stacks by boilers served.
2. Location of stacks by grid coordinates (Universal Transverse Mercator, UTM, or equivalent).[1]
3. Stack height, feet or meters.
4. Stack diameter (inside, top), feet or meters.
5. Exit gas temperature, °F. or °C.
6. Exit gas velocity, feet/sec. or meters/sec.
H. Emission data:
1. Based on emission factors.
2. Estimate of emissions by the source.
3. Results of any stack tests conducted.

III. MANUFACTURING ACTIVITIES (PROCESS LOSSES)

A. Process name or description of each product.
B. Quantity of raw materials used and handled for each product, maximum quantity per hour, and average quantity per year.
C. Quantity of each product manufactured, maximum quantity per hour, and average quantity per year.
D. Description of annual, seasonal, monthly, weekly, and daily operating cycle including downtime for maintenance and repairs.
E. Air pollution control equipment in use (existing and proposed):
E. Air pollution control equipment in use (existing and proposed):
1. Type.
2. Collection efficiency (design and actual), percent.
F. Stack data:
1. List of stacks by equipment served.
2. Location of stacks by grid location (UTM or equivalent).[1]
3. Stack height, feet or meters.
4. Stack diameter (inside, top), feet or meters.
5. Exit gas temperature, °F. or °C.
6. Exit gas velocity, feet/sec. or meters/sec.
G. Emission data:
1. Based on emission factors.
2. Estimate of emissions by the source.
3. Results of any stack tests conducted.

IV. SOLID WASTE DISPOSAL

A. Amount and description of solid waste generated, quantity per year.
B. Percent of total that is combustible.
C. Method of disposal (on-site or off-site).
D. Description of on-site disposal method, if applicable (incineration, open burning, landfill, etc.) including maximum quantities disposed per hour and average quantities disposed per year and actual operating schedule.
1. Location of the source by a grid system (UTM or equivalent).[1]
2. If method of disposal is by an incinerator, include the following information:
a. Auxiliary fuel used.
b. Air pollution control equipment (existing and proposed):
(1) Type.
(2) Collection efficiency (actual and design), percent.
c. Stack data:
(1) List stacks by furnaces served.
(2) Stack height, feet or meters.
(3) Stack diameter (inside, top), feet or meters.
(4) Exit gas temperature, °F. or °C.
(5) Exit gas velocity, feet/sec. or meters/sec.
(6) Exit gas moisture content, percent if available.
3. Emission data:
a. Based on emission factors.
b. Estimate of emissions by the source.
c. Results of any stack tests conducted.

APPENDIX F—AREA SOURCE DATA [1]

(The following information is not required to be submitted with an implementation plan but must be available for inspection by the Administrator, EPA)

Grid Coordinate (lower left-hand corner) -------, -------, UTM or equivalent.[2]
Average Stack Height of Sources— -------.[3]

I. FUEL COMBUSTION—STATIONARY SOURCES

Includes sulfur and ash content of fuels, if applicable).
A. Residential Fuel:
1. Anthracite Coal (plus type and size of unit)[4]—tons/year or metric tons/year.
2. Bituminous Coal (plus type and size of unit)—tons/year or metric tons/year.
3. Distillate Oil (plus type and size of unit)—10^3 gal./year or 10^3 liters/year.

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[1] Required only when diffusion modeling is utilized.
[1] Emissions data for all source categories and subcategories should be summarized in the implementation plans as is in Appendix D or G.
[2] Data is required on a grid basis only when diffusion modeling is utilized. For proportional model technique, data must be available on a county basis.
[3] Required only when diffusion modeling is utilized.
[4] Average type and size for each category. This is used as the basis for selection of average emission factor.

4. Residual Oil (plus type size of unit)—10^3 gal./year or 10^3 liters/year.
5. Natural Gas (plus type and size of unit)—10^6 cu.-ft./year or 10^6 cu.-meters/year.
6. Wood—tons/years or metric tons/year.
7. Other—please specify.

B. Commercial and Institutional Fuel:
1. Anthracite Coal (plus type and size of unit)—tons/year or metric tons/year.
2. Bituminous Coal (plus type and size of unit)—tons/year or metric tons/year.
3. Distillate Oil (plus type and size of unit)—10^3 gal./year or 10^3 liters/year.
4. Residual Oil (plus type and size of unit)—10^3 gal./year or 10^3 liters/year.
5. Natural Gas (plus type and size of unit)—10^6 cu.-ft./year or 10^6 cu.-meters/year.
6. Wood—tons/year or metric tons/year.
7. Other—please specify.

C. Industrial Fuel:
1. Anthracite Coal (plus type and size of unit)—tons/year or metric tons/year.
2. Bituminous coal (plus type and size of unit)—tons/year or metric tons/year.
3. Coke (plus type and size of unit)—tons/year or metric tons/year.
4. Distillate Oil (plus type and size of unit)—10^3 gal./year or 10^3 liters/year.
5. Residual Oil (plus type and size of unit)—10^3 gal./year or 10^3 liters/year.
6. Natural Gas (plus type and size of unit)—10^6 cu.-ft./year or 10^6 cu.-meters/year.
7. Wood—tons/year or metric tons/year.
8. Other—please specify.

II. PROCESS LOSSES (HYDROCARBONS ONLY)

A. Surface coating operations, dry cleaning, degreasing operations, etc., unless considered as point sources—appropriate basis for emission estimate.

III. SOLID WASTE DISPOSAL

A. On-site incineration (plus type of unit)—tons/year or metric tons/year.

B. Open burning—tons/year or metric tons/year.

C. Other—please specify.

IV. TRANSPORTATION

A. Gasoline-powered motor vehicles—appropriate basis for emission estimate, including hydrocarbon evaporative losses.

B. Diesel-powered motor vehicles—appropriate basis for emission estimate.

C. Off-highway fuel usage—10^3 gal./year or 10^3 liters/year.

D. Aircraft—number of flights per year per type of aircraft.

E. Railroads—10^3 gal. diesel oil/year or 10^3 liters/year.

F. Vessels—10^3 gal. or 10^3 liters of oil/year, tons or metric tons of coal/year, or tons or metric tons of wood/year.

G. Gasoline handling evaporative losses—appropriate basis for hydrocarbon emission estimate from filling tank trucks, service station tanks, and automobile tanks.

H. Other—please specify

V. MISCELLANEOUS

A. Forest fires—appropriate basis for emission estimate.

B. Structural fires—appropriate basis for emission estimate.

C. Coal refuse burning—appropriate basis for emission estimate.

D. Agricultural burning—appropriate basis for emission estimate.

E. Other—please specify.

APPENDIX G—(POLLUTANT) EMISSIONS INVENTORY SUMMARY. TONS/YR. (OR METRIC TONS/YR.) (REGIONS WHERE EMISSION LIMITATIONS ARE NOT DEVELOPED)

---------- AIR QUALITY CONTROL REGION

DATA REPRESENTATIVE OF CALENDAR YEAR ----

Source category	State A			State B[i]		
	County 1	----------	County N	State region total	Ditto	Regional[i] total
	ii	ii	ii	ii	Ditto	ii
I. Fuel combustion—Stationary sources:						
A. Area sources [iii]						
B. Point sources						
C. Total						
II. Process losses:						
A. Area sources [iii, iv]						
B. Point sources						
1. Chemical process industries						
2. Food and agricultural industries.						
3. Metallurgical industries						
4. Mineral products industries						
5. Petroleum refining and petrochemical operations.						
6. Wood processing						
7. Petroleum storage						
C. Total						
III. Solid waste disposal:						
A. Area sources [iii]						
B. Point sources						
C. Total						
IV. Transportation: (Area Sources only) [iii, v]						
V. Miscellaneous: (Area Sources only) [iii]						
VI. Grand totals:						
A. Area sources [iii]						
B. Point sources						
C. Total						

[i] Included only if interstate region.
[ii] Existing Emissions.
[iii] If not available, does not need to be submitted for Priority III regions.
[iv] For hydrocarbons only, would include emissions for surface coating operations, dry cleaning, degreasing operations, etc., unless considered point sources.
[v] For hydrocarbons would include vehicle evaporative losses and losses from filling trucks, service station tanks, and automobile tanks.

APPENDIX H—AIR QUALITY DATA SUMMARY

Pollutant	Sampling site location [1]	Sampling interval (months)	Start date	End date	Number of samples	Maximum 1-hour	Maximum 3 hours, 6–9 a.m.	Maximum 8 hours	Maximum 24 hours	Annual arith. mean	Std. dev.	Annual geo. mean	Geo. std. dev.
Particulate matter	X	X	X	X	X				X		X	X	X
Sulfur oxides (as SO_2)	X	X	X	X	X				X	X	X		X
Nitrogen dioxide	X	X	X	X	X					X	X		X
Photo-chemical oxidants	X	X	X	X	X	X				X	X		X
Carbon monoxide	X	X	X	X	X	X		X		X	X		X

X = Date or information required.
[1] UTM Grid coordinate or equivalent.

APPENDIX I—PROJECTED MOTOR VEHICLE EMISSIONS

The assumptions listed below were made in calculating the projected national urban emissions from motor vehicles as shown in Figures 1–3.

a. Emission factors are based on the new Federal test procedure (1), which has an average route speed of 18 miles per hour (29 kilometers per hour).

b. Emission control devices are assumed to just meet present and proposed standards when new, but deteriorate with age. Deterioration factors are adapted from data given in Reference 2.

c. Urban vehicle-mile projections adapted from Reference 3.

d. Distribution of automobiles by age from Reference 4.

e. Relative miles of travel for automobiles (i.e., new cars are driven more than older ones) from Reference 5.

Figures 1–3 can be used to approximate air quality levels resulting from the Federal Motor Vehicle Control Program. The following equation calculates the expected air quality concentration for any given year:

$$A.Q._1 = A.Q._0 \left[\frac{E_1}{E_0} F_0 + (1 - F_0)(GF) \right]$$

where:

Subscripts 0 and 1 denote the base year and future year of interest, respectively.

A.Q.=Air quality (measured or estimated) in region.
E=Normalized emissions from Figures 1–3.
F=Ratio of motor vehicle emissions to total emissions of each pollutant in region.
GF=Growth factor for emission increases from stationary sources.

This equation can be applied directly for carbon monoxide, nitrogen dioxide (if all nitrogen oxides emissions are assumed to be measured as nitrogen dioxide), and nonmethane hydrocarbons (assumes reduction in total hydrocarbon emissions will result in a proportion reduction of measured nonmethane hydrocarbons). The equation cannot directly be applied to determine the reduction in photochemical oxidant levels resulting from reductions in hydrocarbon emissions. The percent reduction in hydrocarbon emissions expected from the Federal Motor Vehicle Control Program can be estimated using that portion of the equation in brackets [ ]. By using Appendix J, it can be determined if this is sufficient to achieve the national standard for photochemical oxidants and if stationary source and/or transportation controls are required.

REFERENCES

1. FEDERAL REGISTER, Vol. 35, No. 219, Part II, Nov. 10, 1970.
2. "Exhaust Emissions from Privately Owned 1966–1970 California Automobiles—A Statistical Evaluation of Surveillance Data," Supplement to Progress Report No. 22 by Arthur J. Hocker, California Air Resources Board, Los Angeles, Calif., Apr. 19, 1971.
3. Landsberg, H. H., Fischman, L. L., and Fisher, J. L., "Resources in America's Future," Johns Hopkins Press, 1963.
4. "Automotive News—1968 Almanac Issue" Slocum Publishing, Detroit, Mich., Apr. 29, 1969.
5. Bostich, T. A., and Greenbalgh, H. J., "Relationship of Passenger Car Age and other Factors to Miles Driven," U.S. Department of Commerce, Bureau of Public Roads, Washington, D.C., Jan. 1967.

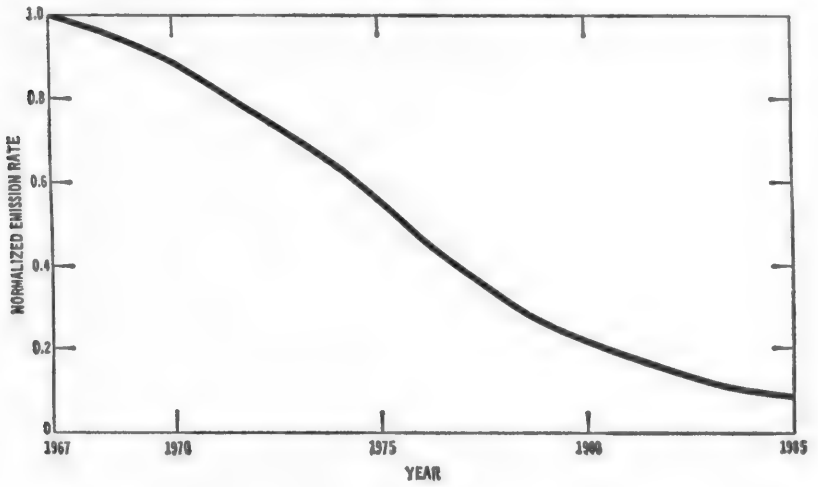

Figure 1. Hydrocarbon emission rates from urban vehicles in United States - projected from 1967 base of 1.

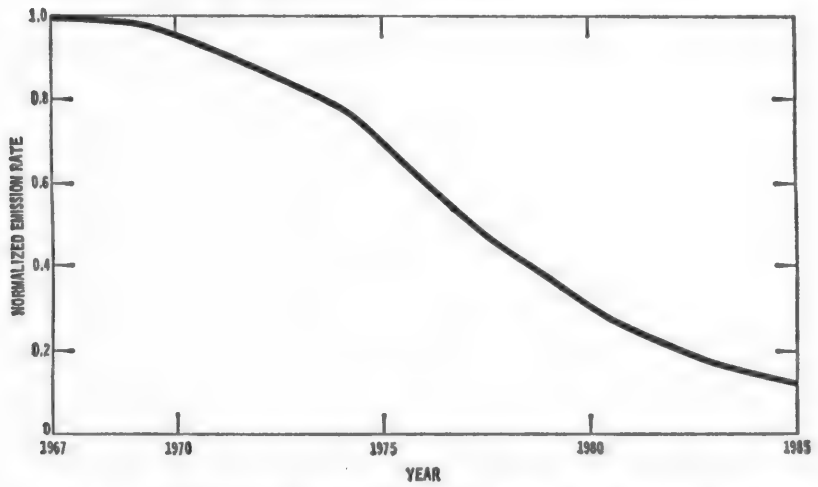

Figure 2. Carbon monoxide emission rates from urban vehicles in United States - projected from 1967 base of 1.

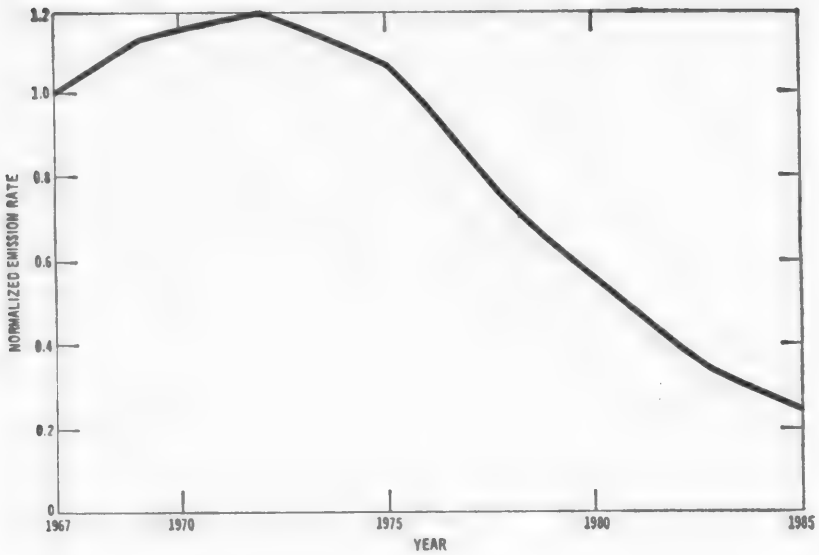

Figure 3. Nitrogen oxides emission rates from urban vehicles in United States - projected from 1967 base of 1.

APPENDIX J

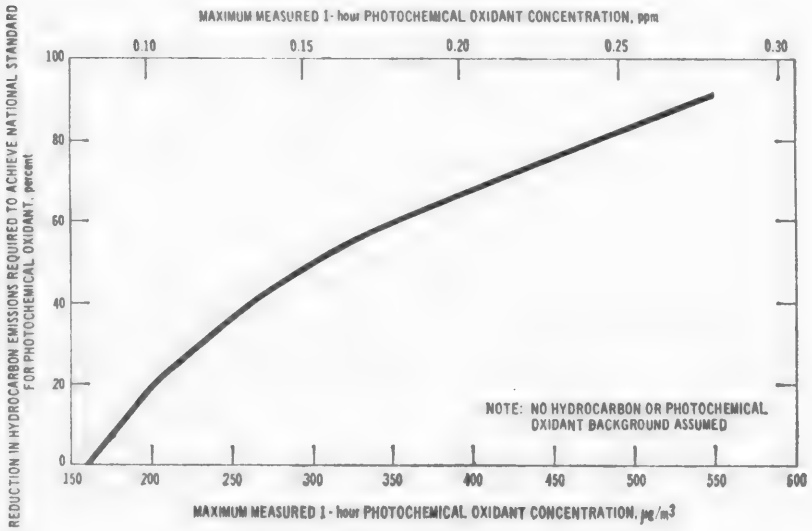

Figure 1. Required hydrocarbon emission control as a function of photochemical oxidant concentration. (Reference: Air Quality Criteria for Nitrogen Oxides, AP-84, Environmental Protection Agency, Washington, D.C., January 1971.)

APPENDIX K—CONTROL AGENCY FUNCTIONS

Man-year estimates by function for State of ---------- portion of ---------- AQCR.

Function	Year							
	Present							
	State agency	Local agencies	State agency	Local agencies	State agency	Local agencies	State agency	Local agencies
Enforcement services (Subtotal)								
Scheduled inspections								
Complaints and field patrol								
Engineering services (Subtotal)								
Permit system								
Emission estimates								
Source testing								
Reports, new legislation, etc.								
Technical services (Subtotal)								
Operation of monitoring network								
Special studies								
Instrument Calibration and Maintenance								
Laboratory operations								
Data processing								
Management services (Subtotal)								
Policy, P/R, Strategies, etc.								
Staff training								
Administrative and clerical support								
Totals								

Fund estimates by function for State of ---------- portion of ---------- AQCR.

Function	Year							
	Present							
	State agency	Local agencies	State agency	Local agencies	State agency	Local agencies	State agency	Local agencies
Enforcement services								
Operating funds								
Capital funds								
Contract funds								
Engineering services								
Operating funds								
Capital funds								
Contract funds								
Technical services								
Operating funds								
Capital funds								
Contract funds								
Management services								
Operating funds								
Capital funds								
Contract funds								
Total operating funds								
Total capital funds								
Total contract funds								
Total funds								

NOTE: Report funds as $1,000.

APPENDIX L—EXAMPLE REGULATIONS FOR PREVENTION OF AIR POLLUTION EMERGENCY EPISODES

The example regulations presented herein reflect generally recognized ways of preventing air pollution from reaching levels that would cause imminent and substantial endangerment to the health of persons. States are required to have emergency episode plans for Priority I regions, but they are not required to adopt the regulations presented herein.

1.5 *Air pollution emergency.* This regulation is designed to prevent the excessive buildup of air pollutants during air pollution episodes, thereby preventing the occurrence of an emergency due to the effects of these pollutants on the health of persons.

1.5.1 *Episode criteria.* Conditions justifying the proclamation of an air pollution alert, air pollution warning, or air pollution emergency shall be deemed to exist whenever the Director determines that the accumulation of air pollutants in any place is attaining or has attained levels which could, if such levels are sustained or exceeded, lead to a substantial threat to the health of persons. In making this determination, the Director will be guided by the following criteria:

(a) "Air Pollution Forecast": An internal watch by the Department of Air Pollution Control shall be actuated by a National Weather Service advisory that Atmospheric Stagnation Advisory is in effect or the equivalent local forecast of stagnant atmospheric condition.

(b) "Alert": The Alert level is that concentration of pollutants at which first stage control actions is to begin. An Alert will be declared when any one of the following levels is reached at any monitoring site:

SO_2—800 $\mu g./m^3$ (0.3 p.p.m.), 24-hour average.

Particulate—3.0 COHs or 375 $\mu g./m^3$, 24-hour average.

SO_2 and particulate combined—product of SO_2 p.p.m., 24-hour average, and COHs equal to 0.2 or product of SO_2—$\mu g/m^3$, 24-hour average, and particulate $\mu g./m^3$, 24-hour average equal to 65×10^3.

CO—17 mg./m^3 (15 p.p.m.), 8-hour average.

Oxidant (O_3)—200 $\mu g./m^3$ (0.1 p.p.m.)—1-hour average.

NO_2—1130 $\mu g/m^3$ (0.6 p.p.m.), 1-hour average, 282 $\mu g./m^3$ (0.15 p.p.m.), 24-hour average.

and meteorological conditions are such the pollutant concentrations can be expected to remain at the above levels for twelve (12) or more hours or increase unless control actions are taken.

(c) "Warning": The warning level indicates that air quality is continuing to degrade and that addition control actions are necessary. A warning will be declared when any one of the following levels is reached at any monitoring site:

SO_2—1,000 $\mu g./m^3$ (0.6 p.p.m.), 24-hour average.

Particulate—6.0 COHs or 750 $\mu g./m^3$, 24-hour average.

SO_2 and particulate combined—product of SO_2 p.p.m., 24-hour average and COHs equal to 1.0 or product of SO_2 $\mu g./m^3$, 24-hour average and particulate $\mu g./m^3$, 24-hour average equal to 327×10^6.

CO—34 mg./m^3 (30 p.p.m.), 8-hour average.

Oxidant (O_3)—800 $\mu g./m^3$ (0.4 p.p.m.), 1-hour average.

NO_2—2,260 $\mu g./m^3$ (1.2 p.p.m.)—1-hour average; 565 $\mu g./m^3$ (0.3 p.p.m.), 24-hour average.

and meteorological conditions are such that pollutant concentrations can be expected to remain at the above levels for twelve (12) or more hours or increase unless control actions are taken.

(d) "Emergency": The emergency level indicates that air quality is continuing to degrade to a level that should never be reached and that the most stringent control actions are necessary. An emergency will be declared when any one of the following levels is reached at any monitoring site:

SO_2—2,100 $\mu g./m^3$ (0.8 p.p.m.), 24-hour average.

Particulate—8.0 COHs or 1,000 $\mu g./m^3$, 24-hour average.

SO_2 and particulate combined—product of SO_2 p.p.m., 24-hour average and COHs equal to 2.0 or product of SO_2 $\mu g./m^3$, 24-hour average and particulate $\mu g./m^3$, 24-hour average equal to 650×10^3.

CO—46 mg./m^3 (40 p.p.m.), 8-hour average.

Oxidant (O_3)—1,200 $\mu g./m^3$ (0.6 p.p.m.), 1-hour average.

NO_2—3,000 $\mu g./m^3$ (1.6 p.p.m.), 1-hour average; 750 $\mu g./m^3$ (0.4 p.p.m.), 24-hour average.

and meteorological conditions are such that this condition can be expected to continue for twelve (12) or more hours.

(e) "Termination": Once declared, any status reached by application of these criteria will remain in effect until the criteria for that level are no longer met. At such time, the next lower status will be assumed.

1.5.2 *Emission reduction plans.* (a) Air Pollution Alert—When the Director declares

an Air Pollution Alert, any person responsible for the operation of a source of air pollutants as set forth in Table I shall take all Air Pollution Alert actions as required for such source of air pollutants and shall put into effect the preplanned abatement strategy for an Air Pollution Alert.

(b) Air Pollution Warning—When the Director declares an Air Pollution Warning, any person responsible for the operation of a source of air pollutants as set forth in Table II shall take all Air Pollution Warning actions as required for such source of air pollutants and shall put into effect the preplanned abatement strategy for an Air Pollution Warning.

(c) Air Pollution Emergency—When the Director declares an Air Pollution Emergency, any person responsible for the operation of a source of air pollutants as described in Table III shall take all Air Pollution Emergency actions as required for such source of air pollutants and shall put into effect the preplanned abatement strategy for an Air Pollution Emergency.

(d) When the Director determines that a specified criteria level has been reached at one or more monitoring sites solely because of emissions from a limited number of sources, he shall notify such source(s) that the preplanned abatement strategies of Tables, I, II, and III or the standby plans are required, insofar as it applies to such source(s), and shall be put into effect until the criteria of the specified level are no longer met.

1.5.3 *Preplanned abatement strategies.* (a) Any person responsible for the operation of a source of air pollutants as set forth in Tables I–III shall prepare standby plans for reducing the emission of air pollutants during periods of an Air Pollution Alert, Air Pollution Warning, and Air Pollution Emergency. Standby plans shall be designed to reduce or eliminate emissions of air pollutants in accordance with the objectives set forth in Tables I–III which are made a part of this section.

(b) Any person responsible for the operation of a source of air pollutants not set forth under section 1.5.3(a) shall, when requested by the Director in writing, prepare standby plans for reducing the emission of air pollutants during periods of an Air Pollution Alert, Air Pollution Warning, and Air Pollution Emergency. Standby plans shall be designed to reduce or eliminate emissions of air pollutants in accordance with the objectives set forth in Tables I–III.

(c) Standby plans as required under sections 1.5.3(a) and 1.5.3(b) shall be in writing and identify the sources of air pollutants, the approximate amount of reduction of pollutants and a brief description of the manner in which the reduction will be achieved during an Air Pollution Alert, Air Pollution Warning, and Air Pollution Emergency.

(d) During a condition of Air Pollution Alert, Air Pollution Warning, and Air Pollution Emergency, standby plans as required by this section shall be made available on the premises to any person authorized to enforce the provisions of applicable rules and regulations.

(e) Standby plans as required by this section shall be submitted to the Director upon request within thirty (30) days of the receipt of such request; such standby plans shall be subject to review and approval by the Director. If, in the opinion of the Director, a standby plan does not effectively carry out the objectives as set forth in Table I–III, the Director may disapprove it, state his reason for disapproval and order the preparation of an amended standby plan within the time period specified in the order.

1.6 *Prohibition of air pollution.* No person shall permit or cause air pollution, as defined in section 1.02 of this part.

1.7 *Compliance schedule.* Except as otherwise specified, compliance with the provisions of applicable rules and regulations shall be according to the following schedule:

1.7.1 *Existing sources.* All existing sources not in compliance with applicable rules and regulations on the date of adoption of such rules and regulations shall be in compliance within 6 months of the date of adoption unless the owner or person responsible for the operation of the source shall have submitted to the Director a control plan and schedule for achieving compliance, such plan and schedule to contain a date on or before which compliance will be attained, and such other information as the Director may require. If approved by the Director, such date will be the date on which the person shall comply. The Director may require persons submitting such a plan to submit subsequent periodic reports on progress in achieving compliance. In no event shall the control plan and schedule prescribe a compliance date later than 3 years from the date of adoption of applicable rules and regulations.

1.8 *Circumvention.* No person shall install or cause the installation or use of any device or any means which, without resulting in reduction in the total amount of air pollutant emitted, conceals or dilutes an emission of air pollutant which would otherwise violate applicable rules and regulations.

1.9 *Severability.* If any provisions of these regulations or the application thereof to any person or circumstances is held to be invalid, such invalidity shall not affect other provisions or application of any other part of these regulations which can be given effect without the invalid provisions or application, and to this end the provisions of these regulations and the various applications thereof are declared to be severable.

NOTE: These example administrative procedures do not include examples for an administrative appeal procedure or for judicial review of decisions of the Director regarding permits and compliance schedules, since such procedures ordinarily are dependent on generally applicable provisions of State law.

TABLE I—ABATEMENT STRATEGIES EMISSION REDUCTION PLANS

ALERT LEVEL

Part A. General

1. There shall be no open burning by any persons of tree waste, vegetation, refuse, or debris in any form.
2. The use of incinerators for the disposal of any form of solid waste shall be limited to the hours between 12 m. and 4 p.m.
3. Persons operating fuel-burning equipment which required boiler lancing or soot blowing shall perform such operations only between the hours of 12 m. and 4 p.m.
4. Persons operating motor vehicles should eliminate all unnecessary operations.

Part B. Source curtailment

Any person responsible for the operation of a source of air pollutants listed below shall take all required control actions for this Alert Level.

Source of air pollution	*Control action*
1. Coal or oil-fired electric power generating facilities.	a. Substantial reduction by utilization of fuels having low ash and sulfur content. b. Maximum utilization of mid-day (12 m. to 4 p.m.) atmospheric turbulence for boiler lancing and soot blowing. c. Substantial reduction by diverting electric power generation to facilities outside of Alert Area.
2. Coal and oil-fired process steam generating facilities.	a. Substantial reduction by utilization of fuels having low ash and sulfur content. b. Maximum utilization of mid-day (12 m. to 4 p.m.) atmospheric turbulence for boiler lancing and soot blowing. c. Substantial reduction of steam load demands consistent with continuing plant operations.
3. Manufacturing industries of the following classifications: Primary Metals Industry. Petroleum Refining Operations. Chemical Industries. Mineral Processing Industries. Paper and Allied Products. Grain Industry.	a. Substantial reduction of air pollutants from manufacturing operations by curtailing, postponing, or deferring production and all operations. b. Maximum reduction by deferring trade waste disposal operations which emit solid particles, gas vapors or malodorous substances. c. Maximum reduction of heat load demands for processing. d. Maximum utilization of mid-day (12 m. to 4 p.m.) atmospheric turbulence for boiler lancing or soot blowing.

TABLE II—EMISSION REDUCTION PLANS

WARNING LEVEL

Part A. General

1. There shall be no open burning by any persons of tree waste, vegetation, refuse, or debris in any form.
2. The use of incinerators for the disposal of any form of solid waste or liquid waste shall be prohibited.
3. Persons operating fuel-burning equipment which requires boiler lancing or soot blowing shall perform such operations only between the hours of 12 m. and 4 p.m.

4. Persons operating motor vehicles must reduce operations by the use of car pools and increased use of public transportation and elimination of unnecessary operation.

Part B. Source curtailment

Any person responsible for the operation of a source of air pollutants listed below shall take all required control actions for this Warning Level.

Source of air pollution	*Control action*
1. Coal or oil-fired electric power generating facilities.	a. Maximum reduction by utilization of fuels having lowest ash and sulfur content. b. Maximum utilization of mid-day (12 m. to 4 p.m.) atmospheric turbulence for boiler lancing and soot blowing. c. Maximum reduction by diverting electric power generation to facilities outside of Warning Area.
2. Oil and oil-fired process steam generating facilities.	a. Maximum reduction by utilization of fuels having the lowest available ash and sulfur content. b. Maximum utilization of mid-day (12 m. to 4 p.m.) atmospheric turbulence for boiler lancing and soot blowing. c. Making ready for use a plan of action to be taken if an emergency develops.
3. Manufacturing industries which require considerable lead time for shut-down including the following classifications. Petroleum Refining. Chemical Industries. Primary Metals Industries. Glass Industries. Paper and Allied Products.	a. Maximum reduction of air contaminants from manufacturing operations by, if necessary, assuming reasonable economic hardships by postponing production and allied operation. b. Maximum reduction by deferring trade waste disposal operations which emit solid particles, gases, vapors or malodorous substances. c. Maximum reduction of heat load demands for processing. d. Maximum utilization of mid-day (12 m. to 4 p.m.) atmospheric turbulence for boiler lancing or soot blowing.
4. Manufacturing industries require relatively short lead times for shut-down including the following classifications. Primary Metals Industries. Chemical Industries. Mineral Processing Industries. Grain Industry.	a. Elimination of air pollutants from manufacturing operations by ceasing, curtailing, postponing or deferring production and allied operations to the extent possible without causing injury to persons or damage to equipment. b. Elimination of air pollutants from trade waste disposal processes which emit solid particles, gases, vapors or malodorous substances. c. Maximum reduction of heat load demands for processing. d. Maximum utilization of mid-day (12 m. to 4 p.m.) atmospheric turbulence for boiler lancing or soot blowing.

TABLE III—EMISSION REDUCTION PLANS

EMERGENCY LEVEL

Part A. General

1. There shall be no open burning by any persons of tree waste, vegetation, refuse, or debris in any form.

2. The use of incinerators for the disposal of any form of solid or liquid waste shall be prohibited.

3. All places of employment described below shall immediately cease operations.

a. Mining and quarrying of nonmetallic minerals.

b. All construction work except that which must proceed to avoid emergent physical harm.

c. All manufacturing establishments except those required to have in force an air pollution emergency plan.

d. All wholesale trade establishments; i.e., places of business primarily engaged in selling merchandise to retailers, or industrial, commercial, institutional or professional users, or to other wholesalers, or acting as agents in buying merchandise for or selling merchandise to such persons or companies, except those engaged in the distribution of drugs, surgical supplies and food.

e. All offices of local, county and State government including authorities, joint meetings, and other public bodies excepting such agencies which are determined by the chief administrative officer of local, county, or State government, authorities, joint meetings and other public bodies to be vital for public safety and welfare and the enforcement of the provisions of this order.

f. All retail trade establishments except pharmacies, surgical supply distributors, and stores primarily engaged in the sale of food.

g. Banks, credit agencies other than banks, securities and commodities brokers, dealers, exchanges and services; offices of insurance carriers, agents and brokers, real estate offices.

h. Wholesale and retail laundries, laundry services and cleaning and dyeing establishments; photographic studios; beauty shops, barber shops, shoe repair shops.

i. Advertising offices; consumer credit reporting, adjustment and collection agencies; duplicating, addressing, blueprinting; photocopying, mailing, mailing list and stenographic services; equipment rental services, commercial testing laboratories.

j. Automobile repair, automobile services, garages.

k. Establishments rendering amusement and recreational services including motion picture theaters.

l. Elementary and secondary schools, colleges, universities, professional schools, junior colleges, vocational schools, and public and private libraries.

4. All commercial and manufacturing establishments not included in this order will institute such actions as will result in maximum reduction of air pollutants from their operation by ceasing, curtailing, or postponing operations which emit air pollutants to the extent possible without causing injury to persons or damage to equipment.

5. The use of motor vehicles is prohibited except in emergencies with the approval of local or State police.

Part B. Source curtailment

Any person responsible for the operation of a source of air pollutants listed below shall take all required control actions for this Emergency Level.

Source of air pollution	*Control action*
1. Coal or oil-fired electric power generating facilities.	a. Maximum reduction by utilization of fuels having lowest ash and sulfur content. b. Maximum utilization of mid-day (12 m. to 4 p.m.) atmospheric turbulence for boiler lancing or soot blowing. c. Maximum reduction by diverting electric power generation to facilities outside of Emergency Area.
2. Coal and oil-fired process steam generating facilities.	a. Maximum reduction by reducing heat and steam demands to absolute necessities consistent with preventing equipment damage. b. Maximum utilization of mid-day (12 m. to 4 p.m.) atmospheric turbulence for boiler lancing and soot blowing. c. Taking the action called for in the emergency plan.
3. Manufacturing industries of the following classifications. Primary Metals Industries. Petroleum Refining. Chemical Industries. Mineral Processing Industries. Grain Industry. Paper and Allied Products.	a. Elimination of air pollutants from manufacturing operations by ceasing, curtailing, postponing or deferring production and allied operations to the extent possible without causing injury to persons or damage to equipment. b. Elimination of air pollutants from trade waste disposal processes which emit solid particles, gases, vapors or malodorous substances. c. Maximum reduction of heat load demands for processing. d. Maximum utilization of mid-day (12 m. to 4 p.m.) atmospheric turbulence for boiler lancing or soot blowing.

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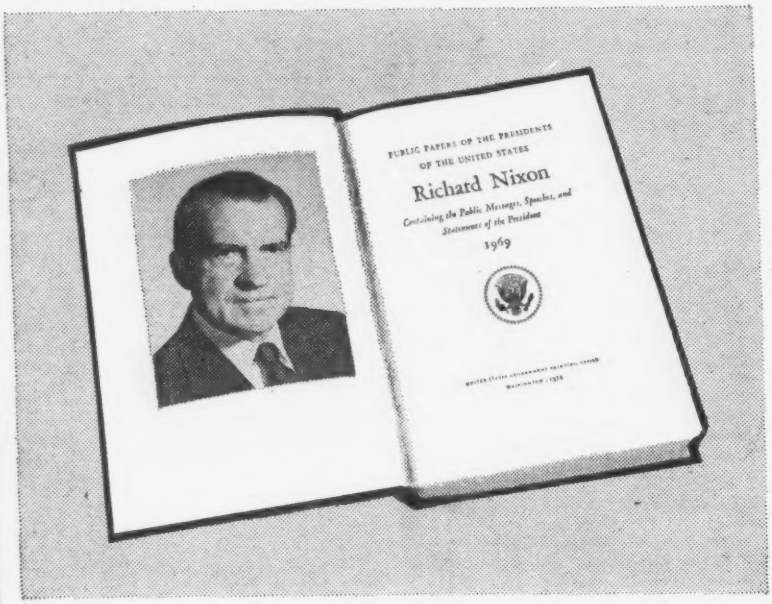

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